HY-RIB

HY-RIB
HANDBOOK

ROOFS—FLOORS—WALLS
SIDINGS—PARTITIONS
CEILINGS—FURRING

SILOS — TANKS — CONDUITS

CONCRETE WITHOUT FORMS

FIFTEENTH EDITION

TRUSSED CONCRETE STEEL CO.
YOUNGSTOWN, OHIO

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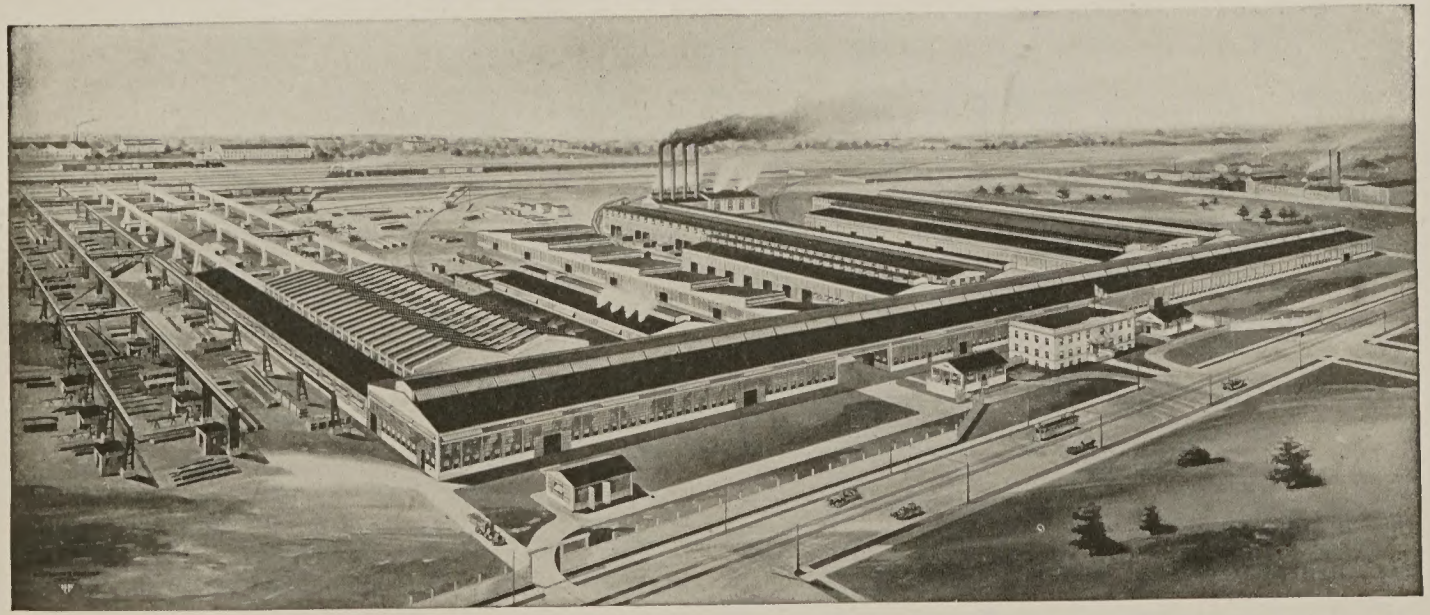
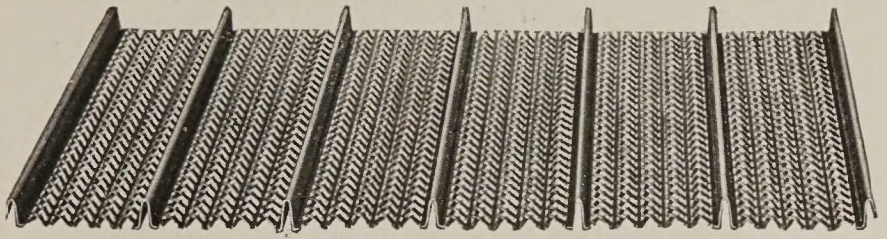


Plant and General Sales Offices of Trussed Concrete Steel Company, Youngstown, O., where Hy-Rib, Rib Lath, Kahn Bars, Rib Bars, Rib Metal, United Steel Sash and other steel products are manufactured. Note the large windows of United Steel Sash and the Hy-Rib concrete roofs and sidings.

Chemical Products Plant (The Trus-Con Laboratories), Detroit, Mich.
Warehouses and Tile Plants in various cities.
Representatives in Principal Cities.



HY-RIB

Hy-Rib is a steel sheathing stiffened by rigid deep ribs, manufactured from a single plate of steel. Hy-Rib is a combined unit of forms, reinforcement, lath and channels for concrete, stucco and plaster.

In concrete floors and roofs, Hy-Rib eliminates forms. In sidings, partitions and ceilings, Hy-Rib eliminates channels and wiring. The mesh of the Hy-Rib provides a perfect surface and key for plaster. Our large factory promptly furnishes Hy-Rib in curved as well as straight sheets.

Why you should use Hy-Rib

All forms are eliminated.
No stiffening channels nor wiring are required.
Concrete and plaster are perfectly reinforced.
Labor and time are saved.
Weight of construction is reduced.
Available floor space is increased.
Fireproof, permanent and economical.

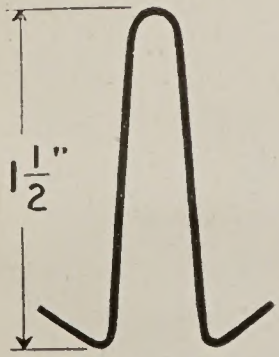
Where you should use Hy-Rib

In all buildings, large or small, in roofs, floors, walls, sidings, partitions, ceilings and furring; in arched floors, culverts, conduits, sewers, silos and tanks.

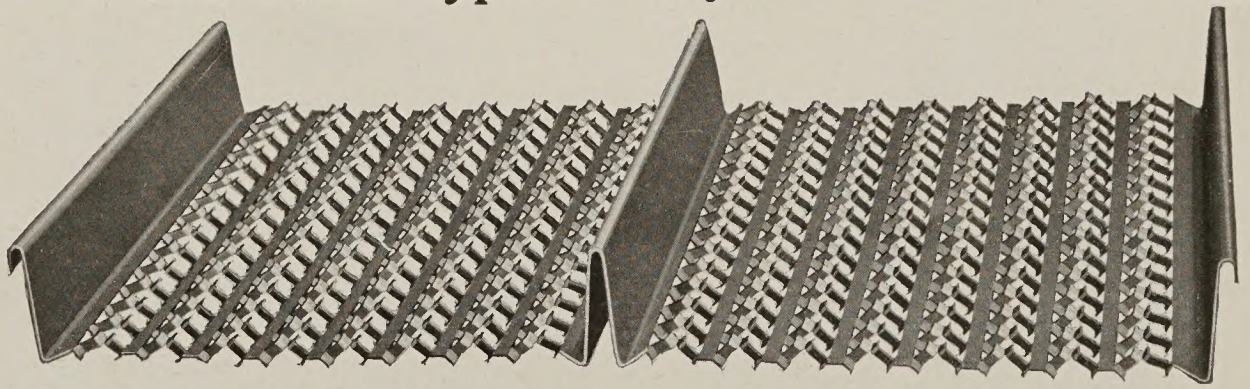
Hy-Rib lowers the cost of building because it eliminates forms and saves materials, labor and time. Hy-Rib provides permanent, fireproof construction that is more economical than wood which burns and rots.

The following pages indicate only the more general applications of Hy-Rib. **Detailed suggestions showing how HY-RIB can be best used in your own particular work will be sent on request.**

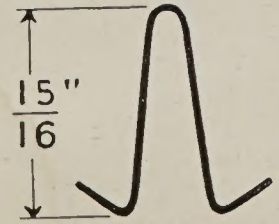
The Four Types of Hy-Rib



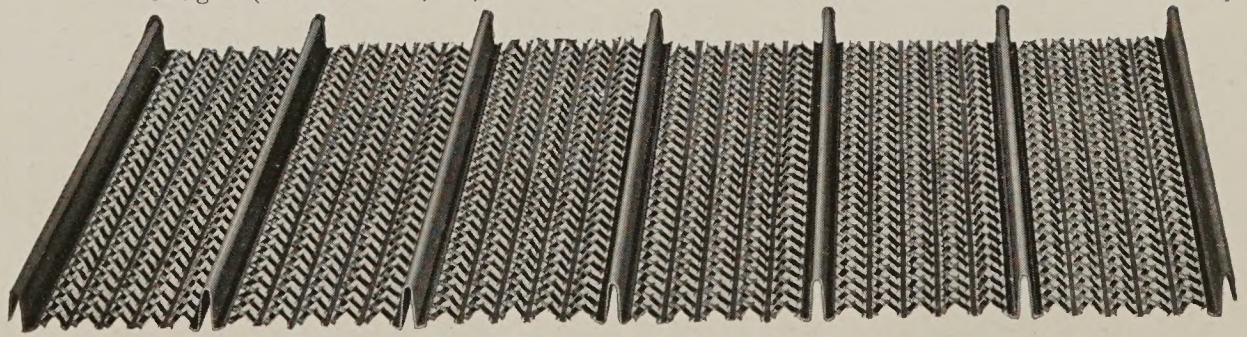
Full size of Rib of 1½" Hy-Rib.



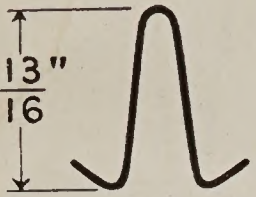
1½" **HY-RIB (DEEP-RIB).** Ribs 1½ in. high, 7 in. apart; sheets 14 in. wide. Gauges (U. S. Stand.) 22, 24 or 26—Standard lengths, 6, 8, 10 and 12 feet.



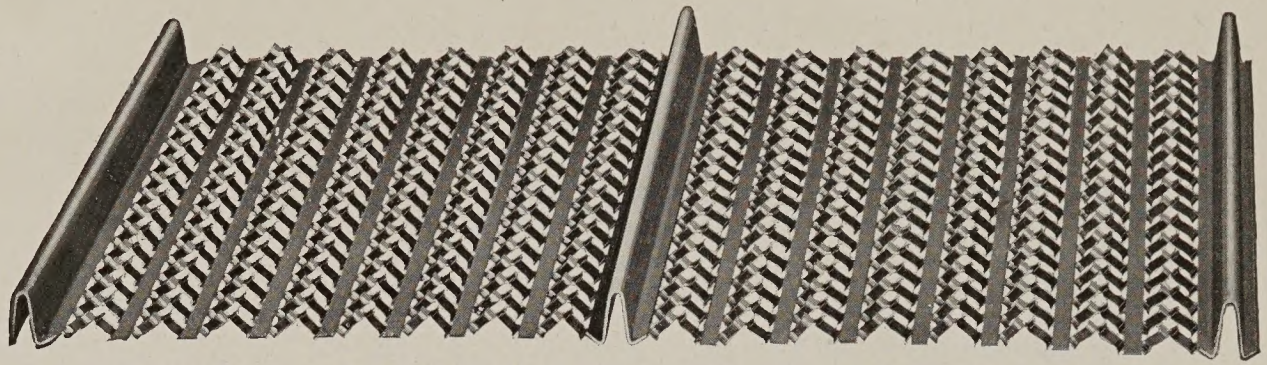
Full size of Rib of $\frac{15}{16}$" Hy-Rib.



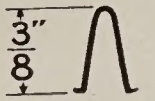
$\frac{15}{16}$" **HY-RIB (SEVEN-RIB).** Ribs 15/16 in. high, 4 in. apart; sheets 24 in. wide. Gauges (U. S. Stand.) 22, 24, 26 or 28—Standard lengths, 6, 8, 10 and 12 feet.



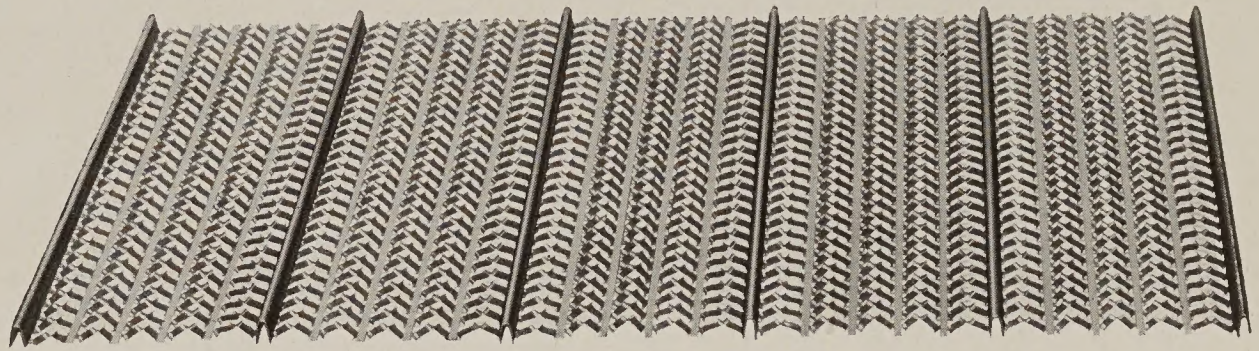
Full size of Rib of 13/16" **Hy-Rib.**



13/16" **HY-RIB (THREE RIB).** Ribs 13/16 in. high, 8 in. apart; sheets 16 in. wide. Gauges (U. S. Stand.) 24, 26 or 28—Standard lengths, 6, 8, 10 and 12 feet.



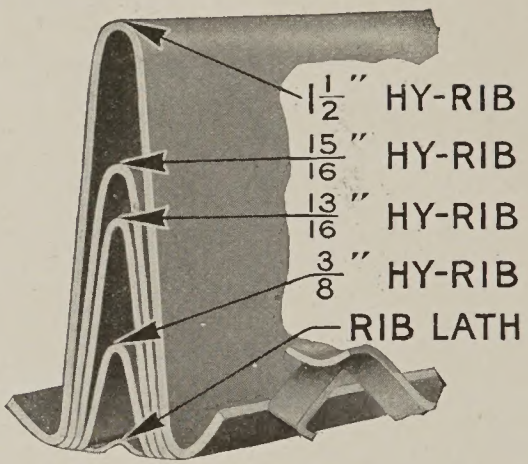
Full size of Rib of 3/8" **Hy-Rib Lath.**



3/8" **HY-RIB LATH.** Ribs 3/8" high, 4 in. apart; sheets 20 in. wide. Gauges (U. S. Stand.) 24, 26 or 28—Standard lengths, 6, 8, 10 and 12 feet.

Other gauges can be furnished on special order. Intermediate lengths are cut without charge except for waste.

It's the depth of the ribs that counts



Specify **Hy-Rib** by its depth—Choose the depth of ribs that most closely meets your exact requirements. Our complete line includes all depths from flat Rib Lath to **Hy-Rib**, with 1½ in. deep ribs—4 distinct types of **Hy-Rib** (pages 6. 7)—3 types of Rib Lath (see pages 136,137)—all in various gauges. The correct material is thus assured at an economical cost for every possible use in building construction.

Properties of Hy-Rib

Type of HY-RIB	Formerly Called	Height of Ribs	Spacing of Ribs	Width of Sheets	Gauge Nos. U. S. Standard
1½ **Hy-Rib**	Deep-Rib	1½″	7″	14″	22, 24, 26
15/16 **Hy-Rib**	7-Rib	15/16″	4″	24″	22. 24. 26. 28
13/16 **Hy-Rib**	3-Rib	13/16″	8″	16″	24. 26. 28
⅜ **Hy-Rib**	6-Rib	⅜″	4″	20″	24. 26. 28

Other gauges are furnished on special order.

Standard lengths, 6, 8, 10 and 12 feet.

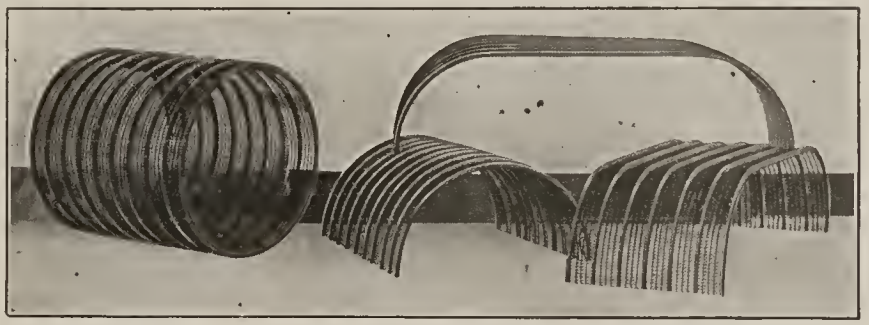
Other lengths are cut from standard lengths without charge except for waste.

In ordering no allowance need be made for side laps. as these are provided in the **Hy-Rib.** Allow *2″* for end laps where splice occurs over supports; otherwise, eight inches.

1½″ and 15/16″ **Hy-Rib** are shipped in bundles of eight sheets; 13/16″ and ⅜″ **Hy-Rib** in bundles of sixteen sheets.

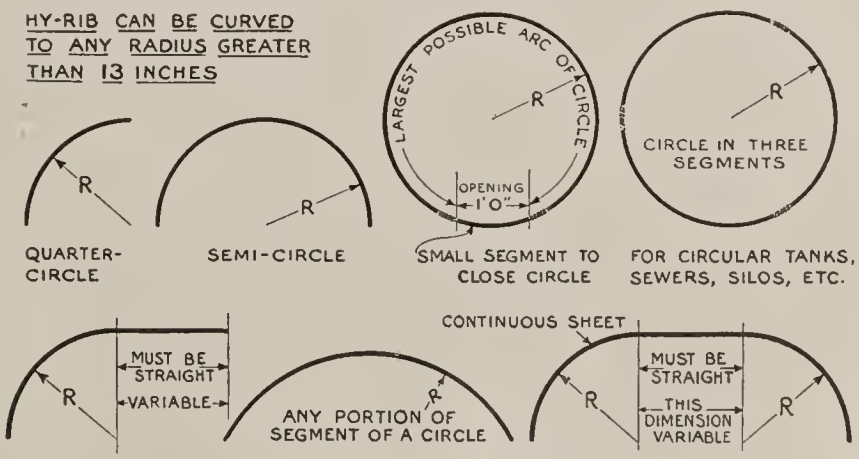
Hy-Rib is supplied either painted or unpainted.

15/16″ **Hy-Rib** (only) is furnished curved to any radius greater than 13 inches.



Hy-Rib Bent to Curve

Our shops can furnish **15/16" Hy-Rib** (only) bent to arcs of circles with any radius greater than 13 inches as indicated below. The Hand Power Bender, shown on page 131, may be used for curving **15/16" Hy-Rib** in the field.



FOR ARCH FLOOR CONSTRUCTION

METHODS OF BENDING 15/16" HY-RIB

Arched **Hy-Rib** Floor in Joseph Bendt Store, Kenosha, Wis., used in conjunction with reinforced concrete beams.

Arched **Hy-Rib** Floor—Union Street Ry. Office Building and Car Barns, Boston, Mass.

Hy-Rib provides the form work for slab and sides of beams. Only formwork required is board at bottom of reinforced concrete beam and a few lines of joists as temporary supports for **Hy-Rib**.

Floors

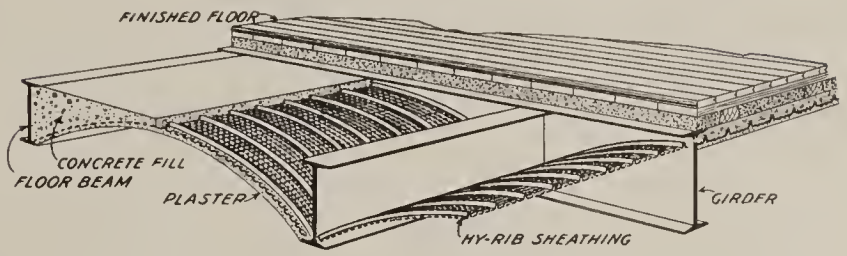
In concrete floors, Hy-Rib eliminates forms and rigidly reinforces the concrete. It simplifies construction, saves time, reduces costs and provides flat or arched floors with any type of beam.

The use of **Hy-Rib** in floors is very simple. Lay the **Hy-Rib** over the supports with the mesh side down and pour on the concrete above. Only enough concrete flows through the mesh to secure a perfect clinch on the steel. The plaster is applied directly to the under surface. **Hy-Rib** provides in itself the forms and reinforcement for concrete, greatly reducing the cost of construction and saving time in erection.

Hy-Rib is manufactured with a rib along each side of the sheet, making a perfect interlocking splice when two sheets are joined, as shown on page 76. A similar interlocking splice is provided at the ends by allowing the two sheets to overlap. In this way absolute continuity of strength and reinforcement is provided throughout the entire floor surface.

For arched floors, $\frac{15}{16}$" **Hy-Rib** is furnished by our shops bent to exact curve, eliminating expensive circular forms. Practical builders know that forms are the most costly and troublesome part of concrete construction. By eliminating all forms, **Hy-Rib** greatly economizes construction, saving time, labor and money.

Arched **Hy-Rib** Floors, Hawaiian Pineapple Co., Honolulu, T. H., showing views from above and below of **Hy-Rib** ready for concreting. Clear spans of 7′ 6″ without use of forms or supports.

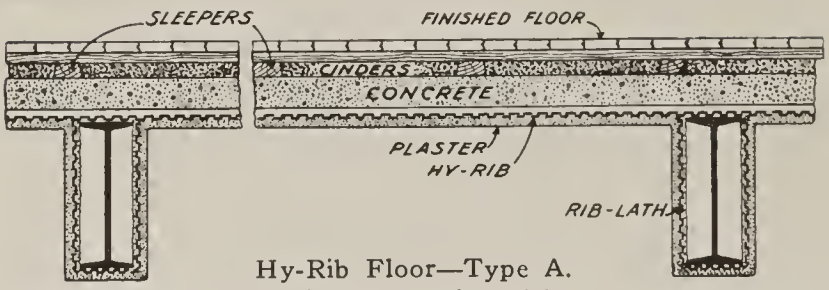


Arched Floors

All the expensive circular forms required in arched floor construction are eliminated by using Hy-Rib, which also provides a rigid, substantial reinforcement for the concrete.

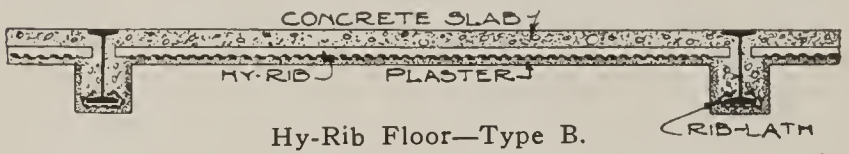
Our shops furnish $\frac{15}{16}$″ **Hy-Rib** bent to the exact curve, ready to set in place between the beams. All types of arched floors are provided (see pages 9, 14, 15), by this shop-curved **Hy-Rib**. Note that in many instances the **Hy-Rib** also furnishes the forms for the sides of the beams, as well as the forms and reinforcement for the floors. The shop bending does away with all special field labor and complicated circular forms.

Arched **Hy-Rib** Floors, Power Station, North Adams Power Co., Boston, Mass.



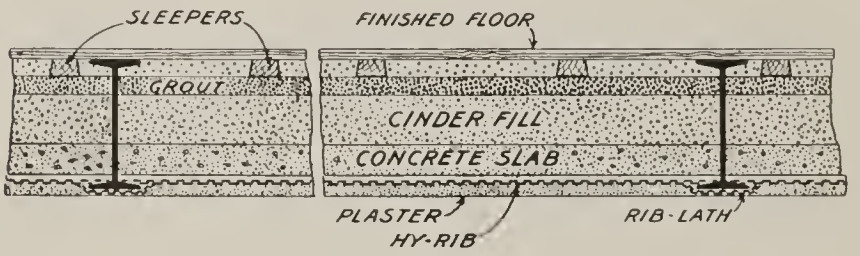
Hy-Rib Floor—Type A.

Hy-Rib sheets are laid on top of steel beams, concrete poured in and under surface plastered; no forms are used. Solid concrete or hollow tile may be substituted for fireproofing of steel beam.



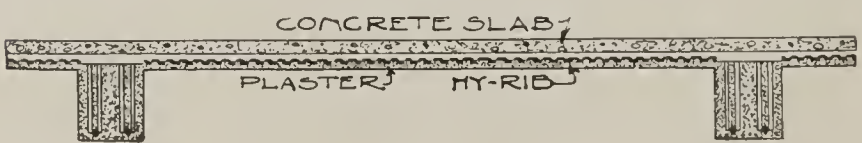
Hy-Rib Floor—Type B.

Finished concrete slab is flush with top of steel beam, giving greater head room below beams. **Hy-Rib** sheets are supported on the sides of beam boxes used as forms for the steel beam fireproofing. No other forms are necessary.



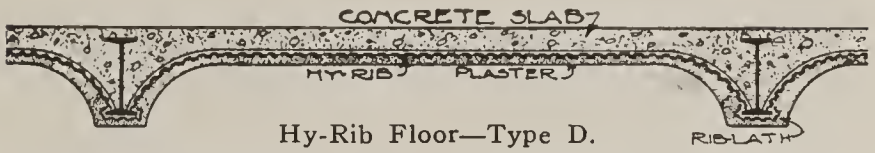
Hy-Rib Floor—Type C.

Flat ceiling is secured by constructing **Hy-Rib** slab on the lower flange of beam. A light cinder fill over the slab brings the finished floor flush with top of steel beam, and no forms are necessary.



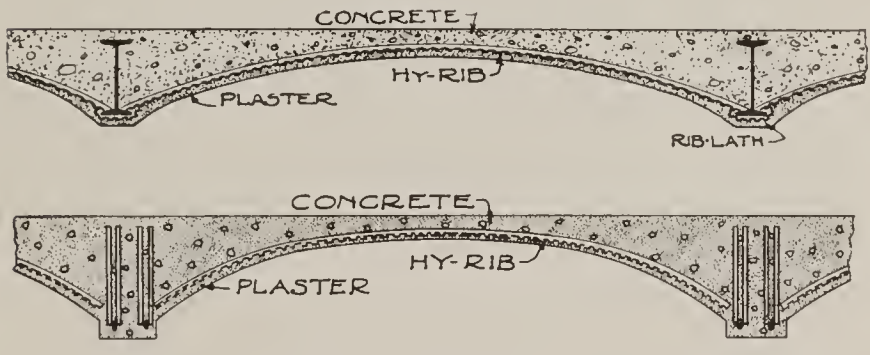
Hy-Rib Floors with Reinforced Concrete Beams—Types A, B and C

Hy-Rib sheets are supported on the sides of the beam boxes used as forms for the concrete beams; no other forms necessary. If **Hy-Rib** extends over concrete beams, punch out the lathing between the ribs to permit filling of the beam.



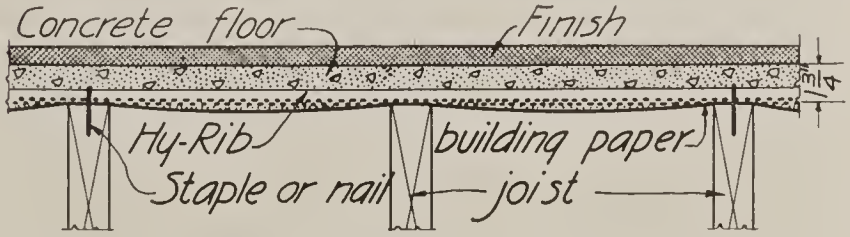
Hy-Rib Floor—Type D.

Ends of **Hy-Rib** sheets are curved (bending done in our shops) and rest on lower flange of beams. **Hy-Rib** provides the fireproofing of steel beams without the use of forms. With reinforced concrete beams the sides of the beam boxes are eliminated as the ends of the **Hy-Rib** sheets rest on the bottom board.



Hy-Rib Floor—Type E.

Arched concrete floors used for carrying heavy loads. **Hy-Rib** comes to the job bent to exact curve. Concrete is poured in above and plaster applied to the under surface. No forms are necessary for the concrete slabs or sides of beams.



Replacing Wood Flooring with Cement, Terrazo, Tile, Etc.

In entrance ways, lobbies, halls, bathrooms, etc., in old buildings, the wood flooring is removed and building paper is tacked to the joists. **Hy-Rib** is placed and concrete poured to proper thickness. This concrete furnishes the necessary base for tile, terrazo or composition flooring.

Under Side of **Hy-Rib** Floor before Plastering.
Edward Ford Plate Glass Co., Rossford, Ohio.
DeVore-McGormley Co., Engineers.

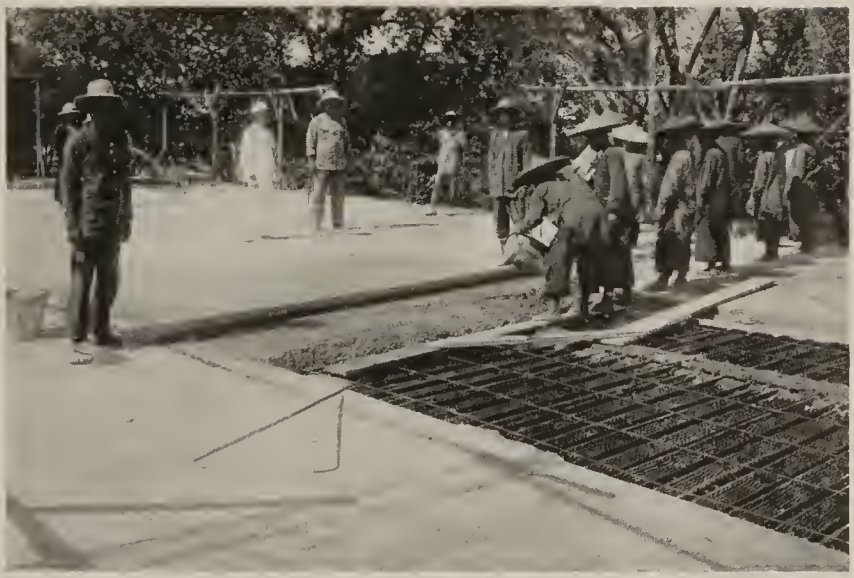
Under Side of **Hy-Rib Floor** (Type C, p. 14) ready for Plastering.
District Court House, Fall River, Mass.

Hy-Rib Floor, K. of P. Orphanage, Weatherford, Texas.

Arched **Hy-Rib** Floors (Type D, page 15) before attaching **Hy-Rib** Suspended Ceiling. Detroit Athletic Club Building, Detroit, Mich.

St. Mary's Hospital, Milwaukee, Wis.
Esenwein & Johnson, Archts. J. D. Gregg, Supervising Archt.
Arched **Hy-Rib** floors throughout. **Hy-Rib** ready for concreting.

Arched **Hy-Rib** Floors, Westgate Common Mills, London, Eng.



Pouring concrete floor, reinforced with 1½" **Hy-Rib.**
St. Andrew School, Singapore, Straits Settlement.
Note Chinese women carrying concrete in buckets.

Concrete Bridge Floor reinforced with 1½" **Hy-Rib**—Viaduct over Nolan Creek, Belton, Texas.

Load of 1,400 lbs. per sq. ft. after Fire Test of 1700° for Four hours.

New York Fire Test on Hy-Rib Arch

(Compiled from official report of Fire, Load and Water Test made upon cinder concrete floor arches at Columbia Fire Testing Station, New York. Test was conducted by Ira H. Woolson, E. M., in co-operation with City Building Bureaus.)

Span of segmental arch, 8 feet; thickness at crown, 4½ inches; total depth at haunches, 15 inches. Concrete—Portland cement 1 part, sand 1 part, unsifted cinders 6 parts.

The concrete floor arch reinforced with **Hy-Rib** was subjected to a continuous fire below the floor for four hours at an average temperature of 1700 degrees F., floor carrying at the same time a distributed load of 150 lbs. per square foot. At the end of the four hours the under side of floor while still red hot was subjected to a 1⅛ inch stream of cold water for five minutes. Then the upper side of the floor was flooded and afterwards the stream was again applied on the under side for five minutes.

After cooling, the arch was subjected to a load of 600 lbs. per square foot. Later a 6 ft. wide section was cut out of the floor arch and this section was loaded to 1400 lbs. per square foot. Under this severe load the deflection was only ¼ inch.

As a result of this test the Building Departments of Manhattan and Brooklyn have approved the use of cinder concrete arches reinforced with **Hy-Rib**, 4 inches thick at the crown, for loads up to 350 lbs. per sq. ft. and span of 8 feet.

Loads carried by Arched Hy-Rib Floors

Arched Concrete Floors are capable of carrying very heavy loads, as has been frequently demonstrated in actual tests. (See New York Fire Test, page 20.) Curved **Hy-Rib** constitutes an ideal type of combined centering and reinforcement for arched floors. Expensive circular forms are thus eliminated and the **Hy-Rib**, curved in our own shops, is exceptionally economical in placing and handling. Curved **Hy-Rib** sheets have far greater stiffness as centering than straight sheets, thus permitting of a wider spacing of supports.

The theoretical design of arches assumes absolutely rigid abutments. The thrust per lineal foot may be figured by means of the following formula:

$$T = \frac{1.5\ W\ L^2}{R}$$

Where W = the load per square foot
L = span in feet between supports, and
R = rise of the arch in inches.

The crown thickness may be determined by the following formula:

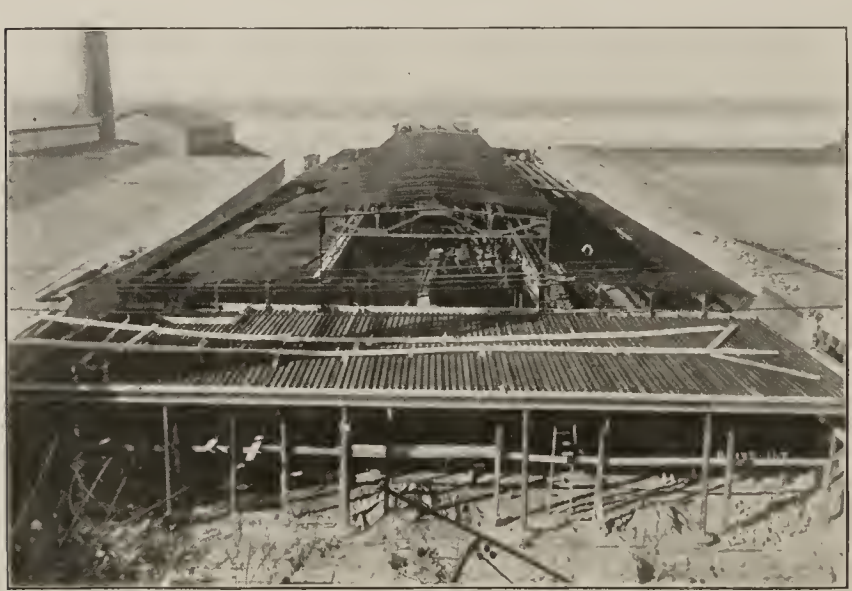
$$C = \frac{T}{12S}$$

Where C = the crown thickness in inches
T = the thrust per lineal foot, and
S = the allowable fibre stress per sq. inch.

In actual building construction, it is practically impossible to secure absolutely rigid abutments, unless tie rods are used, and the crown thickness must therefore be materially increased over the depth determined by the above formula. There is no question but that an Arched Concrete Floor is capable of carrying considerably more load than a flat slab of the same thickness. For loads on flat slabs, see pages 37 to 39.)

Our engineers have had wide experience in the design of arched floors under varying conditions. We would be glad to submit our detailed suggestions on the design of arched floors to meet any particular condition.

Hy-Rib Roof for Packard Motor Car Co., Detroit, Mich.
Albert Kahn, Architect
Ernest Wilby, Assoc.



Hy-Rib roof ready for concreting, Hayden Pump Company, Quincy, Ill. No forms required.

Roofs

Thin concrete roofs, light in weight, are built with Hy-Rib without the use of forms. The great saving in dead weight reduces the size and cost of purlins, roof trusses, columns and foundations.

This thin slab also saves in concrete materials and in the labor of placing them.

No forms are required with **Hy-Rib** concrete roofs. Imagine the tremendous saving in false work, especially in industrial plants, where the roofs are often 20 to 50 feet above the ground. **Hy-Rib** provides a perfect fireproof construction at economical cost—easily and rapidly installed.

The construction is very simple. **Hy-Rib** sheets are placed over purlins, concrete applied and under surface plastered. The simple scaffolding for the plasterers is readily hung from the trusses.

Corrugated iron sheets, frequently used in roofs and sidings of industrial buildings, are unsatisfactory, as they rust out in a short time and have to be painted frequently. The permanent nature of **Hy-Rib** concrete makes it far more economical, while its initial cost is but little more than corrugated iron. **Hy-Rib** concrete roofs entail no expense for maintenance. Owing to the insulating qualities of the concrete construction, a marked saving in cost of heating the building is effected.

Hy-Rib Roofs before Concreting. Edward Ford Plate Glass Co., Rossford, O.
DeVore-McGormley Co., Toledo, O., Engineers.
Over 1,000,000 sq. ft. of **Hy-Rib** Construction. United Steel Sash Throughout.

M. C. R. R. Station, Detroit, Mich. Immense Area of roofs of Train Sheds (size 1,100 ft. by 240 ft.) are of **Hy-Rib** Concrete Construction. Windows of Train Shed, Service Building, Express Building and Street Car Shelter are of United Steel Sash.

Geo. A. Fuller Co., Contractors.

Geo. H. Webb, Chief Engineer.

Hy-Rib Roofs, International Harvester Co., Springfield, O. DeVore-McGormley Co., Engrs.

Hy-Rib Roofs, Featherstone Foundry, Chicago, Ill. Arnold Co., Engineers.

Hy-Rib Roofs and Sidings, Ford Motor Co., Detroit.

Albert Kahn, Architect
Ernest Wilby, Assoc.

Milwaukee Corrugating Co., Milwaukee, Wis.
Hy-Rib Concrete Roofs and Partitions; United Steel Sash for Windows.

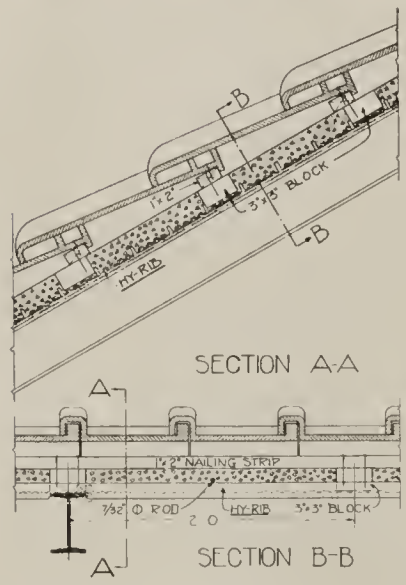
Hy-Rib Roofs and Partitions. Windows of United Steel Sash. Repair shops, Louisville Railway Co., Louisville, Ky. J. B. and E. T. Hutchings, Archts.

Hy-Rib Concrete Roofs and Sidings, Continental Motor Mfg. Co., Detroit, Mich. Albert Kahn, Architect; Ernest Wilby, Associate.

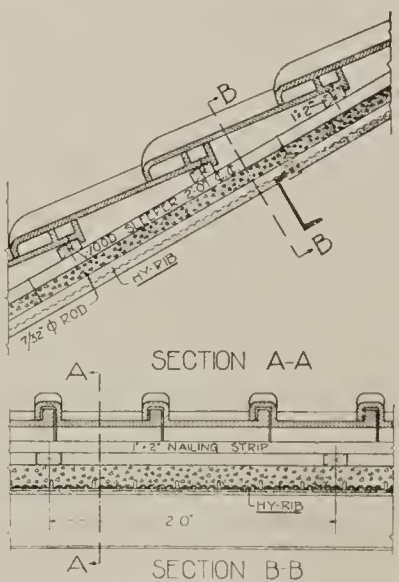
Hy-Rib Roofs, Fayette R. Plumb Tool Co., St. Louis, Mo.

Hy-Rib Roofs, Kempsmith Mfg. Co., West Allis, Wis.

Hy-Rib Roofs for Stables, City Water Works, Detroit, Mich. Smith, Hinchman & Grylls, Architects.

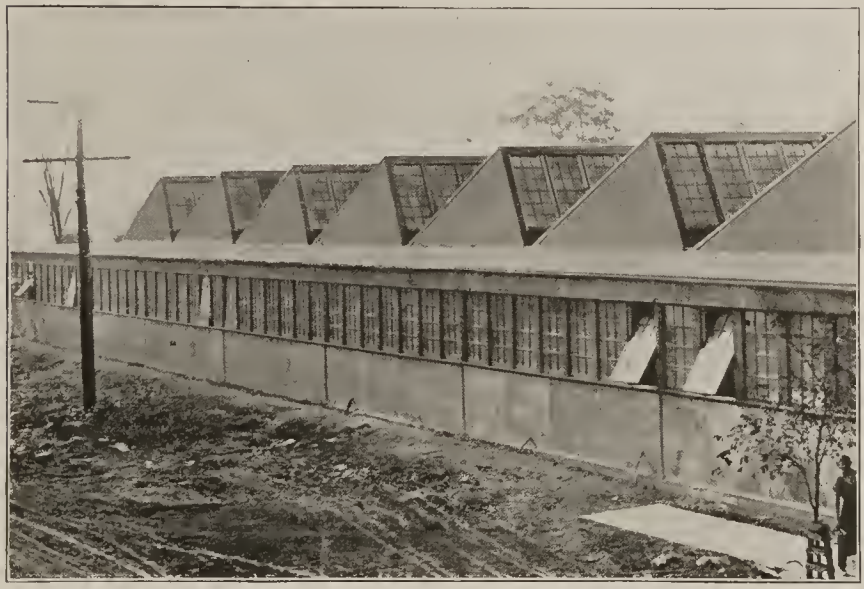


DETAIL OF ROOF TILE SUPPORTS WITH RIBS OF HY-RIB EXTENDING HORIZONTALLY

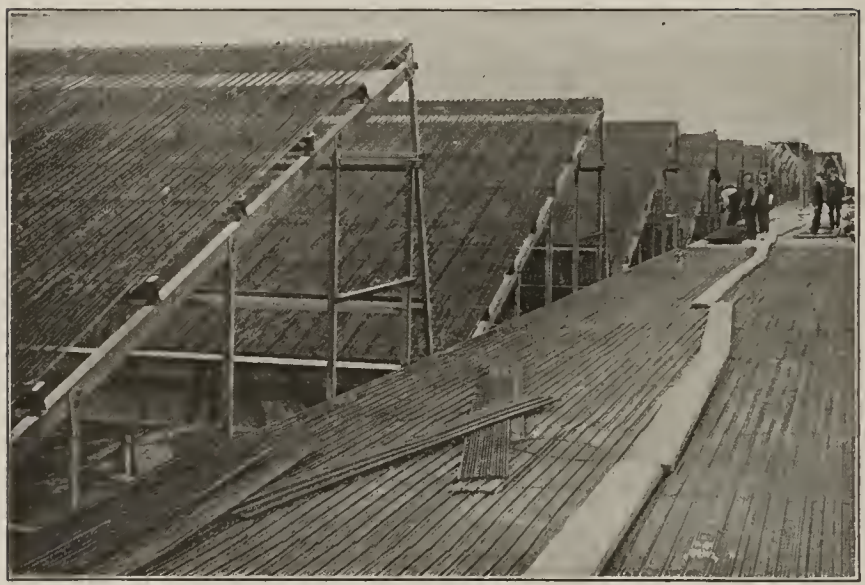


DETAIL OF ROOF TILE SUPPORTS WITH RIBS OF HY-RIB EXTENDING IN DIRECTION OF ROOF SLOPE

Hy-Rib Concrete Roof, Pennsylvania Rubber Co., Jeannette, Pa.
W. G. Wilkins Co., Architect and Engineers.



Hy-Rib Saw-tooth Roofs and Sidings.
Jackson Cushion Spring Co., Jackson, Mich.

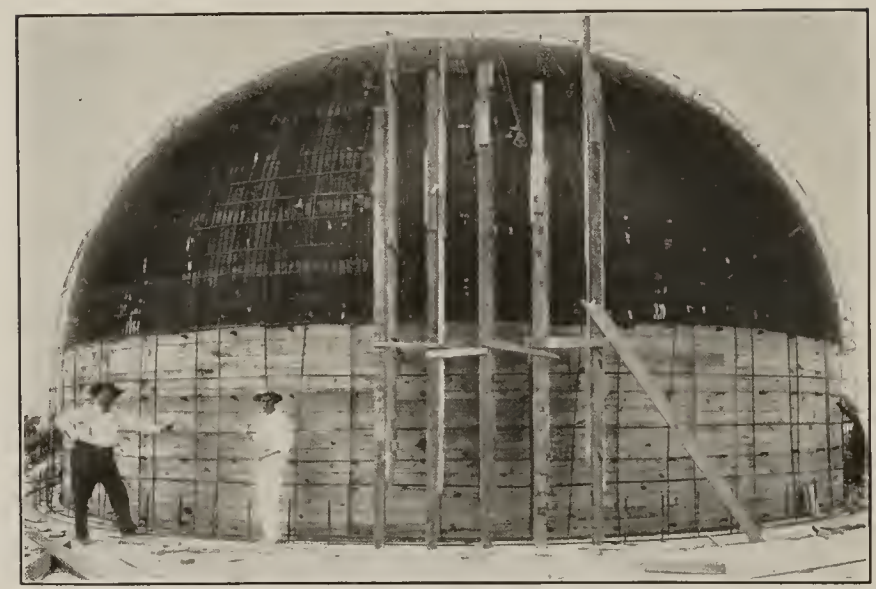


Hy-Rib Saw-tooth Roofs, Oliver Chilled Plow Co., Hamilton, Ont.
David Dick & Son, Contractors. Prack & Perrine, Architects.

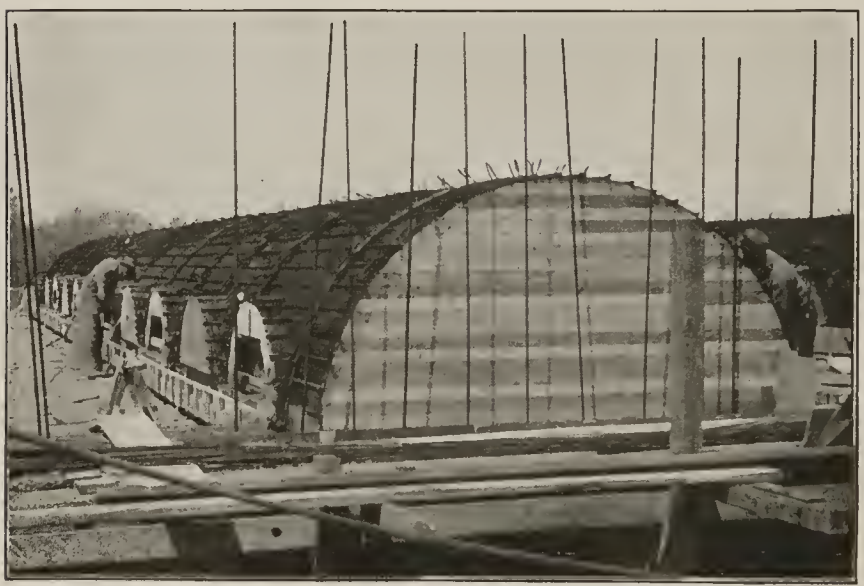
Hy-Rib Concrete Side Walls and Sawtooth Roofs.
Western Sugar Refining Co., San Francisco, Cal.

Hy-Rib Roof for Soft Foundry Building.
American Car & Foundry Co., Berwick, Pa.

Southern Methodist University, Dallas, Texas.
Shepley, Rutan & Coolidge, Architects,
Dome and entire roof of **Hy-Rib** Construction.

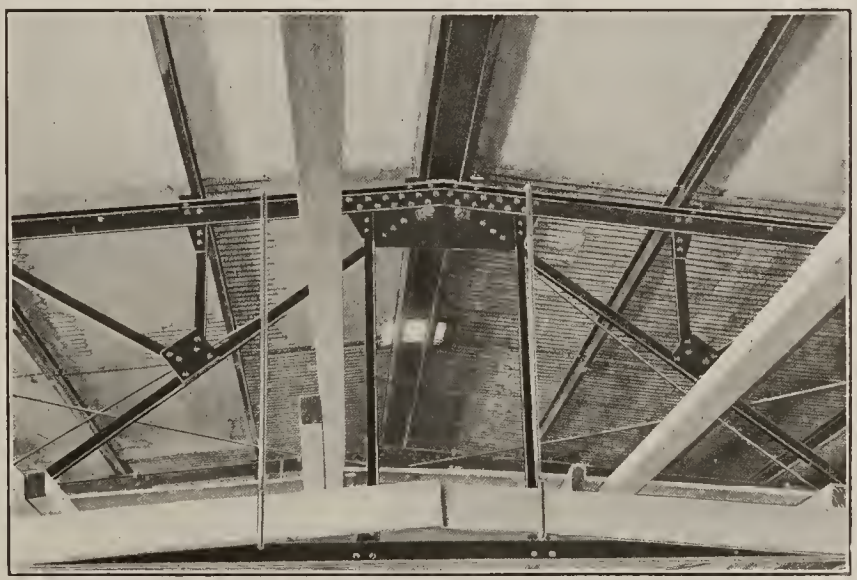


Hy-Rib Dome for Presidential Palace, Republic of Cuba, Havana, Cuba.



Roof of 1½" **Hy-Rib,** Fairview Mausoleum, **Milwaukee, Wis.**

Concreting 1½" **Hy-Rib** on roof of a building at our Youngstown Plant.



Under side of **Hy-Rib** Roof, partly plastered.
Note plasterer's scaffold suspended from steel truss.
Only one coat of Cement Plaster necessary.

Terrific heat of 160 gallons of burning Kerosene has no effect on **Hy-Rib** Concrete Tank. Size: 5′ x 5′ x 5′, 3 ins. thick.

2 in. Concrete Slab reinforced with **Hy-Rib,** 5′ ¼″ clear Span. Mixture, 1:2:4. Designed for a live load of 112 lbs. per sq. ft. and carrying load of 625 lbs. per sq. ft. Fire and Load Tests conducted by Howarth Erskine, Ltd., Singapore, Straits Settlements.

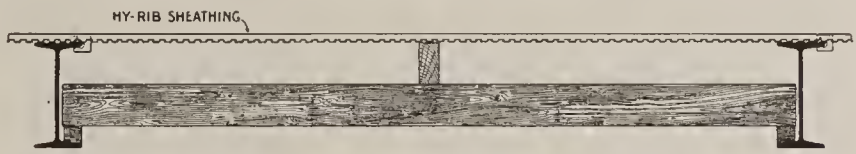
Explanation of Hy-Rib Slab Tables

Pages 38 and 39

Upper table gives safe loads carried by slab after the concrete has thoroughly set. Safe loads include weight of slab. In floors and roofs weight of the slab must be deducted from the loads given to determine the safe live load. Lower table is used to determine the load **Hy-Rib** will carry as centering before the concrete has set.

Example: Given a 6 ft. span to carry a safe live load of 110 lbs. per sq. ft. Use tables on page 38. Opposite 2½-inch slab reinforced with No. 24 $\frac{15}{16}$" **Hy-Rib** read 152 lbs. load. Deduct from this load 36 lbs. (weight of 2½-inch slab + ½ in. cement plaster underneath), giving safe live load of 116 lbs.

Lower table, page 38, shows that No. 24 $\frac{15}{16}$" **Hy-Rib** as centering will not support the weight of 2½ inches of wet concrete on 6 ft. span, but will carry it on a span as great as 3' 4". Therefore use one temporary line of shoring down the center of the span. This shoring is removed after concrete has set.



Temporary Supports for HY-RIB as Used in Floors and Roofs—Required Only in Special Cases. See lower table, pages 38 and 39.

Designing Data for Hy-Rib

Hy-Rib is manufactured from the highest grade of open hearth rolled steel plates, also from Copper Bearing Steel.

Type of Hy-Rib	Cross-Sectional Area of Steel per foot of width including side laps (square inches).				Distance of Center of Gravity from Flat Side
	28 Gauge	26 Gauge	24 Gauge	22 Gauge	
$\frac{15}{16}$" **Hy-Rib** (7-Rib)	.137	.164	.219	.273	.33 in.
1½" **Hy-Rib** (Deep-Rib)		.177	.236	.295	.50 in.

Weights of Hy-Rib (lbs. per sq. ft.)

Type of Hy-Rib	22 Gauge	24 Gauge	26 Gauge	28 Gauge
1½" **Hy-Rib**	1.340	1.072	.804	
$\frac{15}{16}$" **Hy-Rib**	1.322	1.057	.793	.661
$\frac{13}{16}$" **Hy-Rib**		.793	.595	.496
⅜" **Hy-Rib**		.635	.476	.397

$\frac{15}{16}$" Hy-Rib (7-Rib) Tables

Safe Loads in Pounds per Square Foot for Slabs Reinforced with 15/16" Hy-Rib

(See also table below)

(Safe loads include weight of slab.)

(For safe live loads, deduct weight of slab)

Thickness of slabs above base of sheathing	Gauge No. $\frac{15}{16}$" Hy-Rib	Moment of resistance per foot of width	SPAN IN FEET								
			3	4	5	6	7	8	9	10	11
2" thick slab Wt.=24 lbs. per sq. ft.	28	3140	291	164	104	73					
	26	3770	348	196	125	87					
	24	5020	464	261	167	117					
2½" thick slab Wt.=30 lbs. per sq. ft.	28	4080	377	212	136	94	69	53			
	26	4900	453	255	163	113	83	63			
	24	6530	605	340	217	152	111	85			
	22	8160	755	425	272	189	139	106			
3" thick slab Wt.=36 lbs. per sq. ft.	28	5020	464	261	167	116	85	65			
	26	6020	558	314	200	140	102	78	62		
	24	8020	742	417	267	186	136	104	82		
	22	10030	927	520	334	232	170	130	103		
3½" thick slab Wt.=42 lbs. per sq. ft.	28	5960	551	310	198	138	101	77			
	26	7150	660	371	238	165	122	93	73		
	24	9530	882	496	317	221	162	124	98	79	
	22	11910	1101	620	397	276	202	155	122	99	
4" thick slab Wt.=48 lbs. per sq. ft.	28	6900	638	358	230	160	117	90	71		
	26	8270	768	431	276	192	140	108	86	69	
	24	11030	1020	572	367	256	188	144	114	92	76
	22	13790	1275	716	459	319	234	179	142	114	95

B. M. $= \frac{1}{10}$ w l².

For B. M. $= \frac{1}{12}$ w l², add 20% to above loads.
For B. M. $= \frac{1}{8}$ w l², deduct 20% from above loads.

Maximum Spans for 15/16" Hy-Rib (7-Rib) as Centering

To support various thicknesses of wet concrete. For greater spans use temporary supports.

Gauge of 15/16" Hy-Rib	THICKNESS OF SLAB					
	1½"	2"	2½"	3"	3½"	4"
No. 28	3′ 5″	3′ 0″	2′ 8″	2′ 5″	2′ 3″	2′ 1″
No. 26	3′ 9″	3′ 3″	2′11″	2′ 8″	2′ 6″	2′ 4″
No. 24	4′ 4″	3′ 9″	3′ 4″	3′ 1″	2′10″	2′ 8″
No. 22	4′11″	4′ 3″	3′ 9″	3′ 5″	3′ 2″	3′ 0″

1½" Hy-Rib (Deep-Rib) Tables

Safe Loads in Pounds per Square Foot for Slabs Reinforced with 1½" Hy-Rib

(See also table below)

(Safe loads include weight of slab.)

(For safe live loads, deduct weight of slab)

Thickness of slabs above base of sheathing	Gauge No. 1½" Hy-Rib	Moment of resistance per foot of width	SPAN IN FEET										
			3	4	5	6	7	8	9	10	11	12	13
2½" thick slab													
Wt.=30 lbs.	26	4870	451	254	162	113	83	63					
per sq. ft.	24	6500	601	338	216	150	110	85					
3" thick slab	26	6090	563	317	203	141	104	79	63				
Wt.=36 lbs.	24	8120	751	423	270	188	138	106	84				
per sq. ft.	22	10150	940	529	338	234	172	132	104				
3½" thick slab	26	7310	676	380	243	169	124	95	75				
Wt.=42 lbs.	24	9740	901	508	324	225	165	127	100	81			
per sq. ft.	22	12180	1126	663	406	282	207	158	125	102			
4" thick slab	26	8530	789	443	284	197	145	111	88	71			
Wt.=48 lbs.	24	11370	1052	592	379	263	194	148	117	95	78		
per sq. ft.	22	14210	1318	740	473	329	242	185	146	118	98		
4½" thick slab	26	9740	901	508	324	225	165	126	100	81			
Wt.=54 lbs.	24	12990	1202	678	433	301	221	170	134	108	89	75	
per sq. ft.	22	16240	1505	847	541	376	276	211	167	135	112	94	
5" thick slab	26	10960	1013	570	365	254	186	142	113	91			
Wt.=60 lbs.	24	14620	1352	761	487	338	248	190	152	122	100	84	
per sq. ft.	22	18270	1688	950	609	422	310	237	187	152	126	106	90
5½" thick slab	26	12180	1123	632	406	281	207	158	125	102			
Wt.=66 lbs	24	16240	1500	845	541	376	276	211	167	135	112	94	
per sq. ft.	22	20300	1880	1058	676	470	345	264	209	169	140	118	100

B. M. $= \frac{1}{10}\, w\, l^2$.

For B. M. $= \frac{1}{12}\, w\, l^2$, add 20% to above loads.
For B. M. $= \frac{1}{8}\, w\, l^2$, deduct 20% from above loads.

Maximum Spans for 1½" Hy-Rib (Deep-Rib) as Centering

To support various thicknesses of wet concrete. For greater spans use temporary supports.

Gauge of 1½" Hy-Rib	THICKNESS OF SLAB								
	2"	2½"	3"	3½"	4"	4½"	5"	5½"	6"
No. 22	5' 7"	5' 0"	4' 6"	4' 2"	3'11"	3' 8"	3' 6"	3' 4"	3' 2"
No. 24	5' 0"	4' 5"	4' 1"	3' 9"	3' 6"	3' 4"	3' 2"	3' 0"	2'10"
No. 26	4' 4"	3'10"	3' 6"	3' 3"	3' 0"	2'10"	2' 8"	2' 7"	2' 6"

Specifications for Hy-Rib Floors and Roofs

REINFORCING STEEL.

Provide **Hy-Rib**, Type....., Gauge..... for all floors and roofs.

Place all **Hy-Rib** sheets with the lath surface downward. Interlock all adjoining sheets of **Hy-Rib** at sides and ends. Sheets shall be securely fastened together every 24 inches along the sides and at every rib at the ends by wiring or by clinching of the lapped ribs with special punch. Where end splices occur between supports, splices in adjacent rows must be at least two feet apart. Allow a lap of 2 inches where splices occur over supports, otherwise 8 inches.

Hy-Rib shall be rigidly attached to steel framing by means of clips or strong galvanized wire, and to wood framing by staples or nails. These attachments shall be located at the interlocking side splices at least every 12 inches for $\frac{15}{16}$" **Hy-Rib**, and every 14 inches for 1½" **Hy-Rib**.

Hy-Rib sheets shall be supported as required by lower tables, pages 38 and 39, while concrete is being poured, and, if necessary, temporary supports shall be provided.

No loads shall be placed on **Hy-Rib** before concreting and not until the concrete has thoroughly set. Planks for trucking shall be so arranged as to come over supports.

MATERIALS.

The materials composing the concrete or plaster shall consist of:

(a) Portland Cement which has been carefully tested and found to satisfactorily meet the requirements of the specifications of the American Society for Testing Materials.

(b) Sand which is practically free from organic matter and uniformly graded in size from coarse to fine.

(c) Broken stone or gravel which is good, hard, dense stone—clean and of such size as to pass through a half-inch ring.

(d) Hydrated Lime which is uniform in quality and perfectly hydrated.

APPLICATION.

Cover the **Hy-Rib** sheets with a concrete made up as follows:

Portland Cement	1 part
Sand	2 parts
Broken stone	4 parts

The surface shall be floated smooth to receive a standard roofing applied as directed by manufacturers. When the concrete has set sufficiently plaster the under side to a thickness of ⅜ to ½ inch with the following mixture:

Portland Cement	5 parts
Sand	12 parts
Lime Paste	1 part

The cement and hydrated lime, after being thoroughly mixed dry to uniform color, shall be added to the dry sand and the whole manipulated until evenly mixed. Add water to secure proper working consistency and sufficient long cow hair to key. The mortar shall be applied within 30 minutes from time of mixing.

PROTECTION.

The concrete work shall be thoroughly protected from too rapid drying and the direct rays of the sun by means of damp burlap or canvas, or by sprinkling. The concrete slab must be kept thorough moist in this way for at least two days after placing.

EXPANSION RODS.

Where the width of the building is over 200 feet in a direction at right angles to the main ribs of the **Hy-Rib** place 7/32 or ¼ inch round rods, spaced 30 inches apart, on top of the high ribs and at right angles to them.

Specifications for Arched Floors

Specifications for arched floors are the same as above except as indicated in following paragraph:

Where curved sheets of **Hy-Rib** are used for reinforcement of concrete arches it is not necessary to interlock the sheets along the sides, but side ribs shall be thoroughly wired together. Otherwise splice and place **Hy-Rib** as provided for under Floors and Roofs.

(See also pages 13 and 21.)

Warren City Tank & Boiler Works, Warren, Ohio.
Side wall of Hy-Rib and Concrete.

Hy-Rib Concrete Sidings, Mark Manufacturing Co., Evanston, Ill.
Note United Steel Sash in walls and monitors.

Walls and Sidings

Monolithic concrete walls, costing one-half the price of brick, are built of Hy-Rib plastered with cement. Walls are only 2″ thick, and thus add 12 to 20 inches to the floor space on the inside as compared with brick or masonry walls. These walls have great strength and rigidity and are built without forms and stiffening channels.

Hy-Rib concrete is ideal for sidings and curtain walls of industrial buildings, factories, power plants, warehouses, car barns, etc. Such a wall is much less expensive than other types of permanent construction, and much more economical than old-style corrugated iron, which rusts and requires frequent painting.

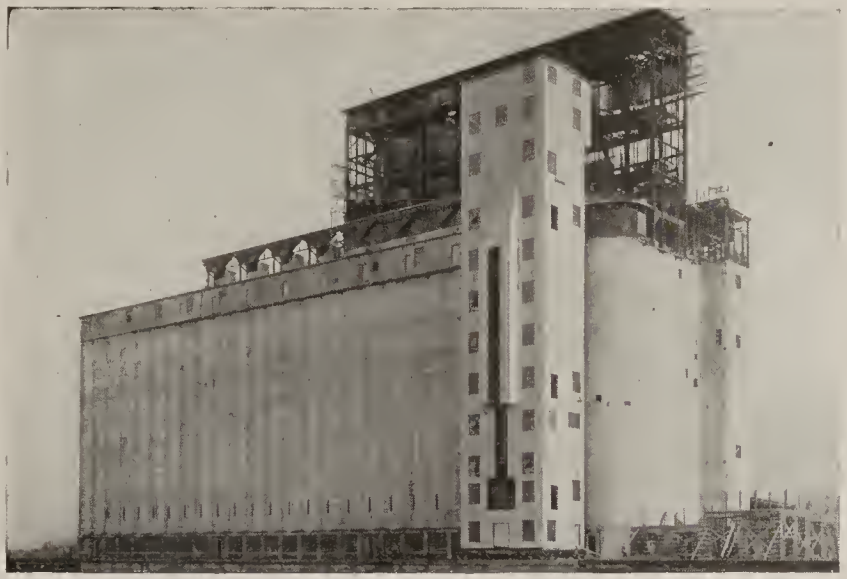
For stucco residences, stores and all types of buildings, Hy-Rib furnishes ideal reinforcement. Occasional posts to carry the weight of the floors are provided, the Hy-Rib is attached directly to them and the cement plaster applied. The extreme stiffness of Hy-Rib permits wide spacing of the supporting members.

Where hollow walls are desired, an additional inside layer of Hy-Rib is applied, leaving an air space between the vertical faces. On the interior the plaster is applied directly to the face of the Hy-Rib. No furring is necessary, as would be required for the ordinary brick wall. The air space between the Hy-Rib sheets makes a building that is easy to heat in winter and one that keeps cool in summer.

The old style building with wooden sidings can be transformed into a modern stucco structure, by applying Hy-Rib and plastering with cement—the ribs of Hy-Rib furnish the necessary furring.

Sunset Publishing Co., San Francisco, Cal.
Geo. W. Kelhane, Architect.
The exterior concrete walls are built with **Hy-Rib** on wood studs.

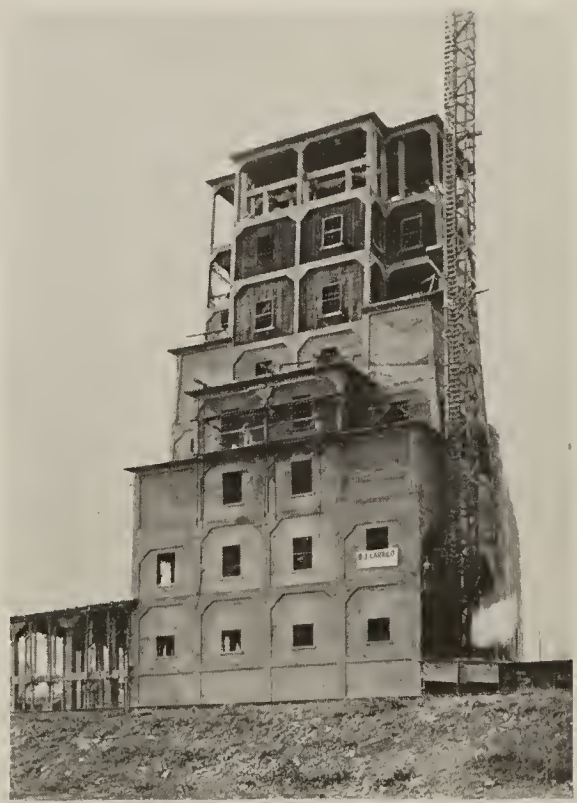
Texas State Fair Assoc., Dallas, Tex., Restaurant Row (500′ x 44′).
Hy-Rib Concrete Walls, Kahn System Reinforced Concrete, United Steel Sash Windows and Doors.



Hy-Rib Sidings used in construction of Superstructure and Tower above Bins, Husted Milling Co., Buffalo, N. Y.

A. E. Baxter & Co., Consulting Engineers. Monarch Engineering Co., Contractors. James G. Davis, Plastering Contractor.

Hy-Rib Sidings for Shaft House, Detroit Salt Works, Oakwod, Mich.

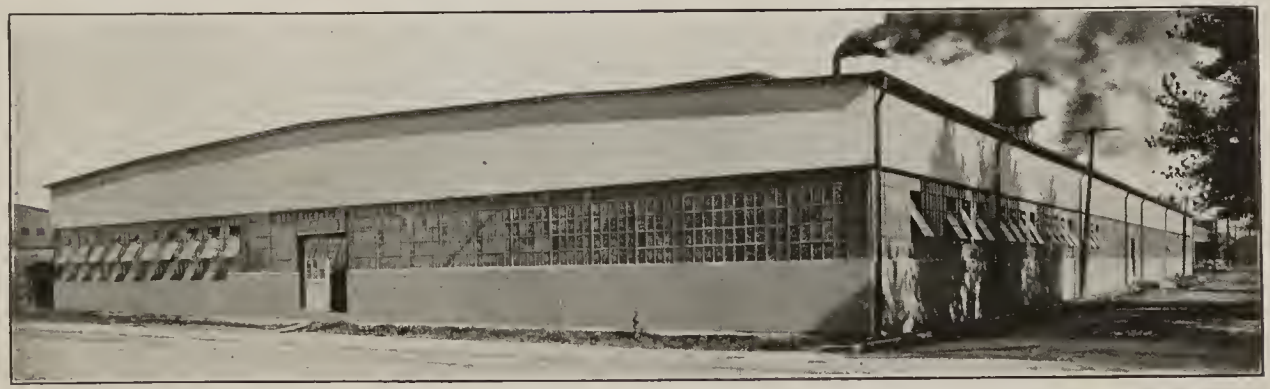


Hy-Rib Sidings, Smith Bros. Grain & Elevator Co., Ft. Worth, Texas.
Kahn System of Reinforced Concrete and United Steel Sash.

American Well and Prospecting Co., Corsicana, Texas. **Hy-Rib** Roofs and Sidings. Windows of United Steel Sash.

Some of the Buildings at our Youngstown Plant. Note **Hy-Rib** Concrete Roofs and Sidings. **United Steel** Sash in Side Walls and Monitors. See bird's-eye view on page 4.

Hy-Rib Siding showing method of plastering. Note **United Steel Sash** above.



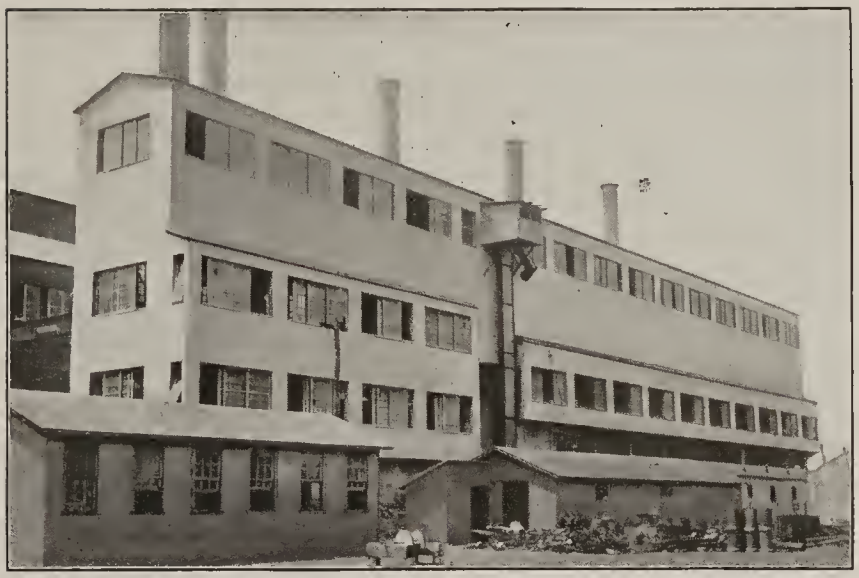
Hy-Rib Sidings, Favorite Stove & Range Co., Piqua, Ohio.

Hy-Rib Sidings and Ceilings, Thawing Plant, Eastern Coal Dock Co., Greenwich Pt., Philadelphia.

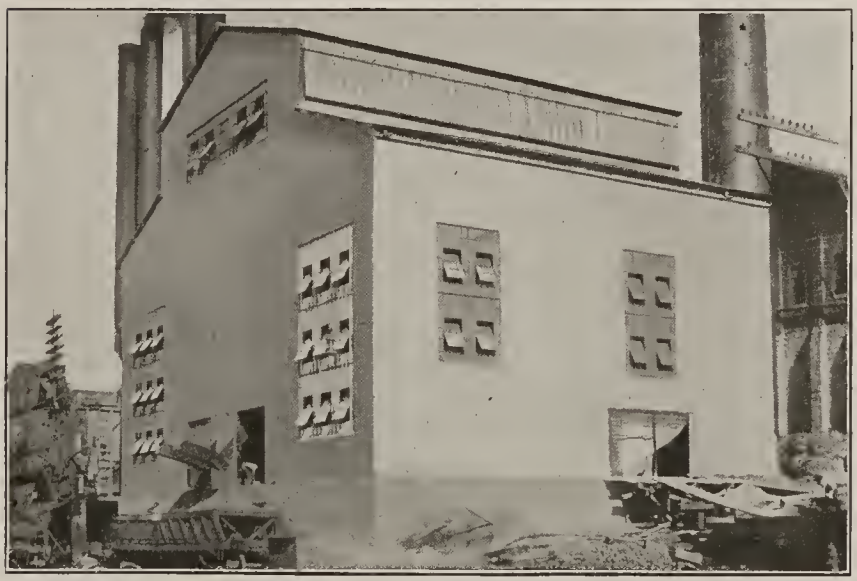
Hy-Rib Sidings and **United Steel Sash.** Columbus Machine & Tool Co., Columbus, O.

Hy-Rib Concrete Sidings and Roofs.
Lake Superior Iron and Chemical Co., Manistique, Mich.

Holyoke Gas Works, Holyoke, Mass.
Isbell-Porter Co., Engineers and Contractors.
Hy-Rib Concrete Sidings and United Steel Sash Windows.



Hy-Rib Roofs and Sidings, Gas Producer Building, Open Hearth Dept., Maryland Steel Co., Sparrows Point, Md.



Hy-Rib Sidings and United Steel Sash for Windows.
Quincy Gas, Electric & Heating Co., Quincy, Ill.
Smith, Hinchman & Grylls, Archts.

Hy-Rib Sidings, Gas Producer Bldg., Ford Motor Co., Detroit, Mich.

Hy-Rib Sidings, American Automatic Railway Switch Co., Birmingham, Ala.

Hy-Rib Roofs and Sidings, Glenmore Distillery, Owensboro, Ky.

Hy-Rib Sidings and Roofs,
Great Lakes Engineering Works, Ashtabula, O.

Coach Repair Shop, N. Y., Westchester & Boston R. R., New York.
Hy-Rib Concrete Sidings. United Steel Sash for Windows.

Barry Mfg. Co., Muscatine, Ia.
Hy-Rib Concrete Sidings and Roofs. United Steel Windows.

Hy-Rib Siding, Power House, Gainesville, Texas.

Hy-Rib Concrete Walls and Floors for Motor Garage, Lumpur, Federated Malay States.

Quarantine Hospital Buildings, San Juan, Porto Rico.
Built of **Hy-Rib** Concrete Construction.

Hy-Rib Residence of Chas. A. Mangold, Oak Cliff, Dallas, Tex.

Hy-Rib Fan House, Birmingham Fuel Co., Birmingham, Ala.

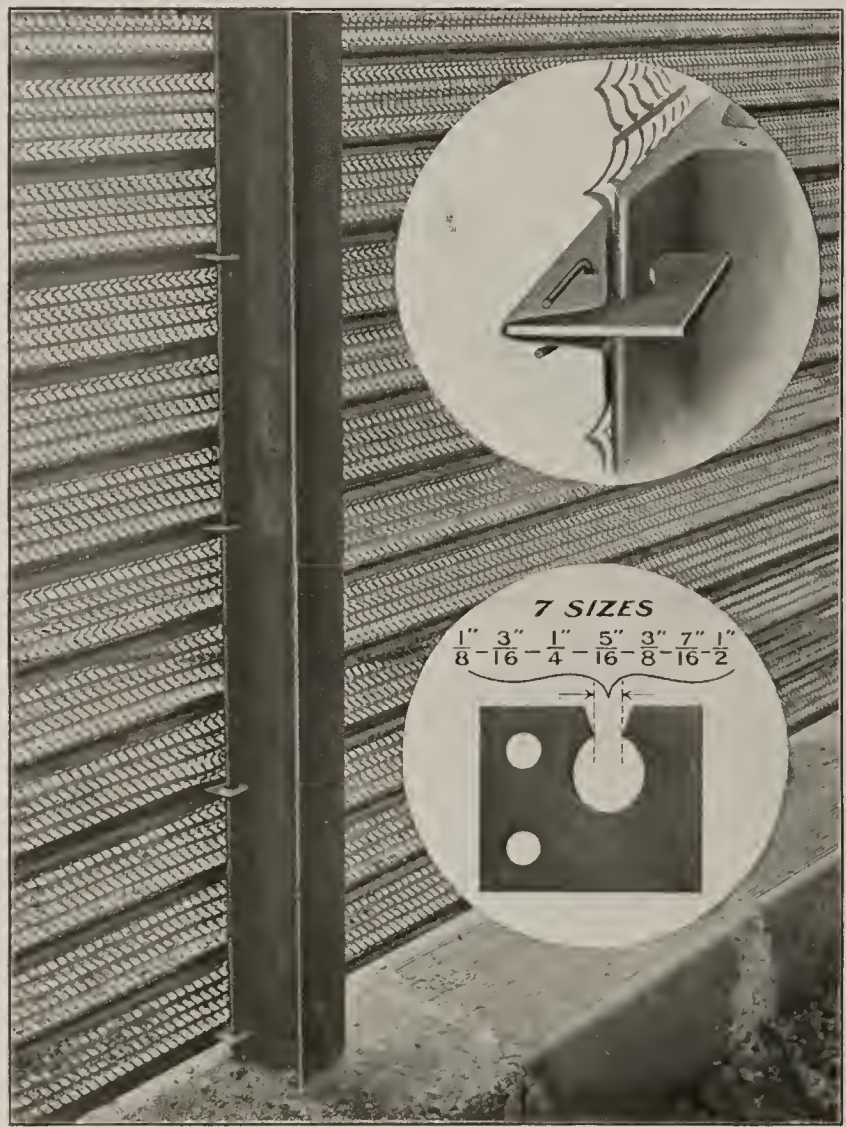


Plate Clips (Patented) Price, 75c per 100

These clips are made of spring steel and when driven on to the flange of the steel work, bite into the steel, gripping it like the jaws of a vise. **A simple, rigid, and inexpensive method of attaching Hy-Rib to structural steel.** Plate Clips should be located at the interlocking side splice between sheets. See **Hy-Rib Punch**, page 133.

Plate Clips Required for Standard I Beams, Channels and Angles

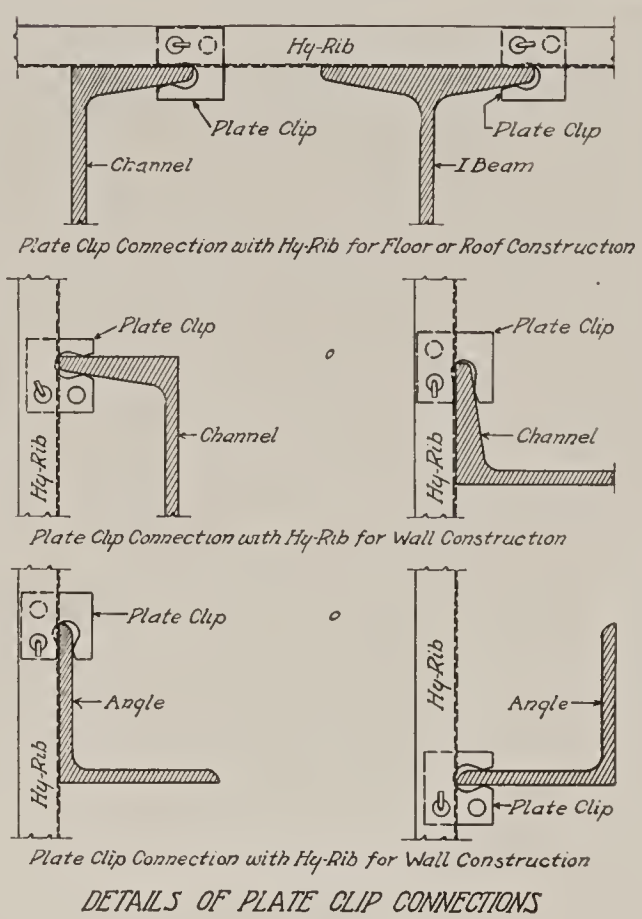
Standard American Sections

I. Standard I Beams			II. Standard Channels		
Size I Beam	Weight lbs.	Plate Clip	Size Channel	Weight lbs.	Plate Clip
18″	55	½″	15″	33	7/16″
15″	42	7/16″	13″	32	⅜″
12″	31.5	⅜″	12″	20.5	⅜″
10″	25	5/16″	10″	15	5/16″
9″	21	5/16″	9″	13.25	¼″
8″	18	5/16″	8″	11.25	¼″
7″	15	¼″	7″	9.75	¼″
6″	12.25	¼″	6″	8	¼″
5″	9.75	¼″	5″	6.5	¼″
4″	7.5	¼″	4″	5.25	¼″
3″	5.5	3/16″	3″	4.5	3/16″

III. Standard Angles

The thickness of angles governs in all cases.

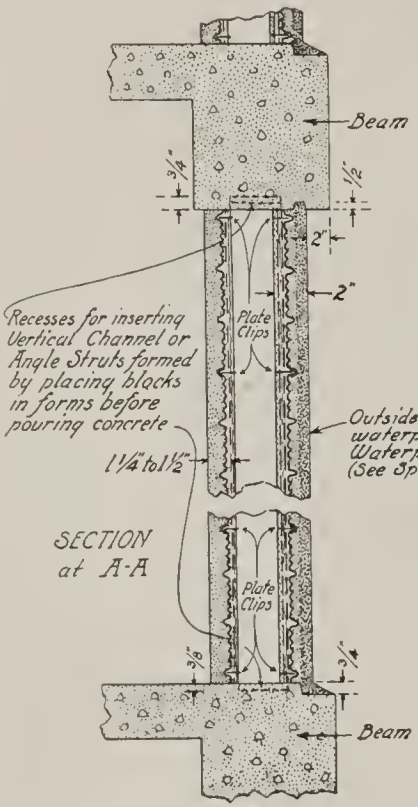
Angle ½″ thick ..... ½″ Plate Clip
Angle 7/16″ thick ..... 7/16″ Plate Clip
Angle ⅜″ thick ..... ⅜″ Plate Clip
Angle 5/16″ thick ..... 5/16″ Plate Clip
Angle ¼″ thick ..... ¼″ Plate Clip
Angle 3/16″ thick ..... 3/16″ Plate Clip
Angle ⅛″ thick ..... ⅛″ Plate Clip



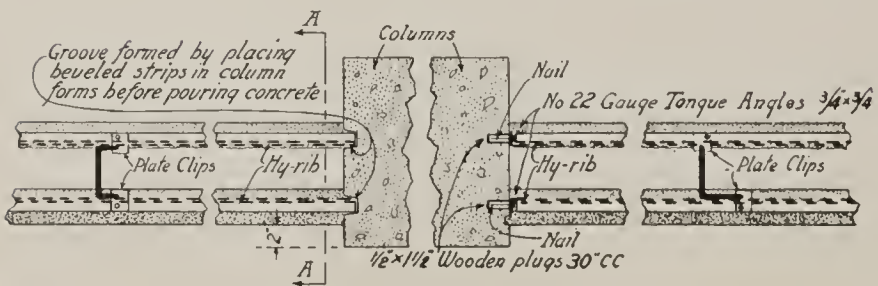
DETAILS OF PLATE CLIP CONNECTIONS

HOLLOW EXTERIOR WALLS BUILT WITH HY-RIB

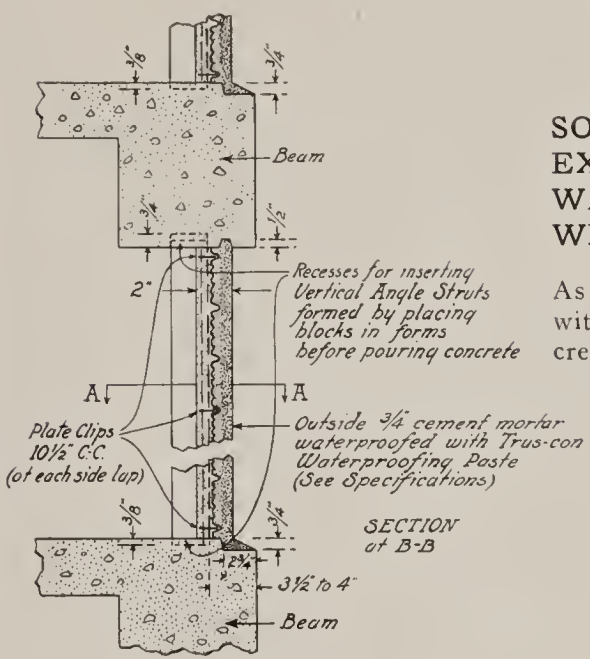
As used in connection with reinforced concrete construction.



Vertical Section.



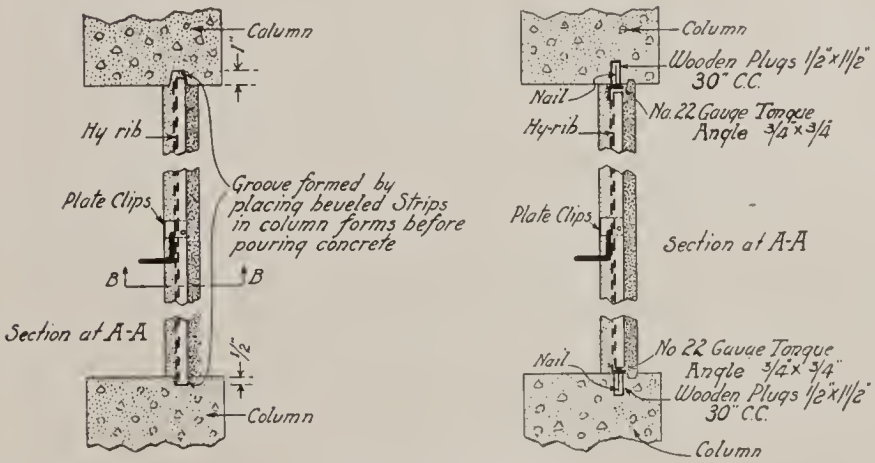
Horizontal Section.



Vertical Section.

SOLID EXTERIOR WALLS BUILT WITH HY-RIB

As used in connection with reinforced concrete construction.



Horizontal Section.

Specifications for Hy-Rib Walls and Sidings

*REINFORCING STEEL.

Provide **Hy-Rib**, Type ...., Gauge .... for all walls and sidings.

Interlock all adjoining sheets of **Hy-Rib** at sides and ends. Sheets shall be securely fastened together every 24 inches along the sides and at every rib at the ends by wiring or by clinching of the lapped ribs with special punch. Where end splices occur between supports, splices in adjacent rows must be at least 2 feet apart. Allow a lap of 2 inches where splices occur over supports, otherwise 8 inches.

Hy-Rib shall be rigidly attached to steel framing by means of clips or strong galvanized wire, and to wood framing by staples or nails. Such attachments shall be located at the interlocking side splices between sheets and shall occur at least every 16 inches for $\frac{3}{16}$" **Hy-Rib**, and every 12 inches for $\frac{1}{8}$" and $\frac{3}{8}$" **Hy-Rib**. Place **Hy-Rib** with the rib side on the outside of the structure.

MATERIALS.

The materials composing the plaster shall consist of:

(a) Portland Cement which has been carefully tested and found to satisfactorily meet the requirements of the specifications of the American Society for Testing Materials.

(b) Sand which is practically free from organic matter and uniformly graded in size from coarse to fine.

(c) Trus-Con Waterproofing Paste, Concentrated, as manufactured by The Trus-Con Laboratories.

(d) Hydrated Lime which is uniform in quality and perfectly hydrated.

APPLICATION.

The plaster for the inside wall and for the first coat of outside wall shall be made up as follows:

Portland Cement	5 parts
Sand	12 parts
Lime Paste	1 part

The cement and hydrated lime, after being thoroughly mixed dry to uniform color, shall be added to the dry sand and the whole manipulated until evenly mixed. Add water to secure proper working consistency. The mortar shall then be thoroughly worked until perfectly homogeneous. This composition shall only be made up in lots that can be immediately applied, and any material that has been mixed with water longer than 30 minutes before applying shall be rejected.

*Wherever it is possible the structure should be so designed that the main ribs of the Hy-Rib will extend horizontally. Where the ribs extend vertically place 7/32 in. or ¼ in. rods 30 ins. apart at right angles to the ribs.

PLASTERING OF WALLS.

Apply the first coat of plaster to the ribbed side of **Hy-Rib**, starting at the bottom of the **Hy-Rib** wall. Add long cow hair to the specified mixture in order to key the plaster. While this coat is still wet scratch over the surface to form a key for the finish coat which shall be applied after the first coat has set sufficiently hard to hold it.

The plaster for the exterior finish coat shall be of the same proportions as scratch coat except that in mixing use water to which **Trus-Con Waterproofing Paste, Concentrated,** has been added in proportions of 1 part paste to 18 parts water. The thickness of this waterproofed mortar shall be at least ¾ of an inch. Finish coat shall be floated free from any porous imperfections.

The interior finish shall then consist of composition above specified without the addition of waterproofing and shall be troweled to a perfectly smooth finish. Total thickness of finished wall shall be 1¾ to 2 inches.

PROTECTION.

Thoroughly protect the finished work from too rapid drying and the direct rays of the sun by means of damp canvas or sprinkling. The finished work must be kept thoroughly moist in this way for at least two days after plastering.

EXPANSION RODS.

In walls and sidings where it is found necessary to run the main ribs of the **Hy-Rib** vertically, place 7/32 or ¼ inch rods, spaced 30 inches apart, at right angles to the ribs.

Side Walls Reinforced with Hy-Rib

(Minimum Requirements)

(Ribs of **Hy-Rib** running horizontally)

Spacing of Supports	Thickness of Wall	REINFORCEMENT
2′	1¾″	No. 28, ⅜″ **Hy-Rib.**
2′-8″	1¾″	No. 26, ⅜″ **Hy-Rib.**
3′	1¾″	No. 28, $\frac{13}{16}$″ **Hy-Rib,** or No. 24, ⅜″ **Hy-Rib.**
6′	1¾″	No. 26, $\frac{13}{16}$″ **Hy-Rib,** or No. 28, $\frac{15}{16}$″ **Hy-Rib.**
8′	2″	No. 24, $\frac{13}{16}$″ **Hy-Rib,** or No. 26, $\frac{15}{16}$″ **Hy-Rib.**
10′	2″	No. 26, $\frac{15}{16}$″ **Hy-Rib.**
12′	2½″	No. 24, $\frac{15}{16}$″ **Hy-Rib.**

Temporary bracing should be used vertically every 5 ft. for $\frac{13}{16}$″ **Hy-Rib,** and 6 ft. for $\frac{15}{16}$″ **Hy-Rib.**

Hy-Rib Partitions, 15 feet high, Merchants' Realty Co., Detroit, Mich. Note extreme height without use of studs or supports; also heavy first coat of plaster made possible by key and stiffness of **Hy-Rib**.

Partitions

Partitions of Hy-Rib require no stiffening channels nor expensive wiring, occupy only 2″, increase floor space and are fireproof and economical.

The ribs of **Hy-Rib** take the place of the steel channels and do away with the expense and labor of wiring lath to them. Owing to the fact that the lath and ribs are a complete unit, made from a single sheet of steel, such partitions have extraordinary rigidity.

The construction of a **Hy-Rib** partition is very simple. Fasten the large sheets of **Hy-Rib** at floor and ceiling and apply the plaster. Cement, lime or patent plaster may be used. **Hy-Rib** presents a flat surface to work against, saves labor and material in plaster and provides a perfect key, without dropping of plaster.

The completed **Hy-Rib** partition is only 2″ thick, as compared with other types occupying 6″ to 8″. This extra space adds proportionally to the rental and investment value of your building.

The fireproofness, soundproofness and strength of the **Hy-Rib** partitions have been repeatedly demonstrated in actual tests. Note tests on pages 36, 66 and 67.

Where hollow partitions are desired, pressed steel studs are used with **Hy-Rib** on each of the two faces, as indicated on page 91. An economical solid partition, using ⅜″ **Hy-Rib** Lath and Kahn Pressed Steel Channels, is shown on page 90.

New York Fire Test on Hy-Rib Partition

Exterior of Partition After Test

(Compiled from official report of Fire and Water Test made at the Columbia Fire Testing Station, New York City, upon plaster partition reinforced with Hy-Rib. Test conducted by Ira H. Woolson, E. M., in co-operation with City Building Bureaus.)

Partitions were of standard size required by the Building Specifications, 14′ 6″x9′ 6″. No 26 Gauge **Hy-Rib** was installed in partition; plaster used was Rock Wall put on in two inside and two outside coats, the approximate total thickness of partition being two inches. The partition was subjected to a continuous fire for one hour, at an average temperature of 1700 degrees Fahr. A 1⅛″ stream of water at hydrant pressure was then thrown against it for two and one-half minutes.

After the application of fire and water, the final maximum deflection in the **Hy-Rib** partition was only ¼″, and partition was in excellent condition.

As a result of the above test, No. 28 Gauge **Hy-Rib** plastered two inches thick for solid partitions, or with two thicknesses of metal for hollow partitions, have been approved for use in the Borough of Manhattan.

Sound-proofness of Hy-Rib Partitions

A solid monolithic partition stands in the front rank in resistance to passage of sound. The solidity of the construction without joints or interstices affords more effective insulation than block construction. The following sound test made by a leading testing laboratory in London, England, demonstrates the soundproofness of **Hy-Rib** Partitions:

To ascertain the relative resistance to the transmission of sound of three "Telephone" Cabinets.

Size of cabinets—3 feet x 3 feet x 6 feet 6 inches high.

Cabinet A. (VV. 2789.) Built with cement and Breeze partition blocks. 3 feet x 12 inches, 2 inches thick, joints made with cement mortar 1-3.

Cabinet B. (VV. 2790.) Built with plaster partition blocks. 3 feet x 12 inches, 2 inches thick, joints made with cement mortar, 1-3.

Cabinet C. (VV. 2791.) Built with **Hy-Rib Sheet** reinforcement (28 gauge) coated each side with cement and sand mortar (1-3), and rendered to a smooth surface inside and out, to a finished thickness of 2 inches.

Under varied and repeated series of observations we find that the C. Cabinet (**Hy-Rib**) shows distinctly greater resistance to the transmission of sound than either A. or B.

(Signed) DAVID KILKALDY & SON,
Testing and Experimenting Work,
99 Southwark St., London, S. E.

July 22, 1912.

Two-inch **Hy-Rib** Partitions after bombardment with shot and shell in Y. M. C. A., Mexico City, February, 1913, illustrating the remarkable resistance of **Hy-Rib** Construction to severest shocks. Plastering holes at nominal cost are all the repairs necessary.

Hy-Rib Partitions and Ceilings, New Monroe Bldg., Norfolk, Va.
Note Grounds for Base Boards and Picture Mold; also Door Bucks set in place for future doors. John Kevan Peebles, Architect.

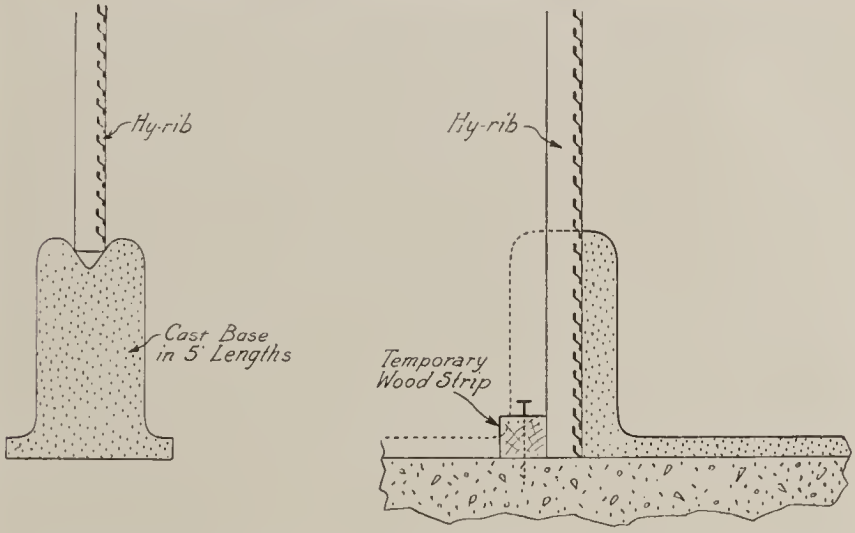
Hy-Rib Partition, E. W. Browning Apartment Hotel, New York
Showing **Hy-Rib**, scratch coat, second coat and finish plaster coat.
Fanning Cerra, Inc., Plastering Contractor. Buchman & Fox, Architects.

Hy-Rib Partition, Trussed Concrete Building, Detroit, Mich.
Note grounds for base-board and chair rail.

Hy-Rib Partition, Y. M. C. A., Portland, Ore. Note the cast cement base as shown in detail on page 73. Also note electric conduits and switch box in **Hy-Rib.**

Plastering flat side of **Hy-Rib** Partition and view from opposite side. Note perfect clinch with no dropping of plaster.

Hy-Rib Partition, Buenos Aires, S. A.
Note switch box and electric conduit in plastered **Hy-Rib**.



Two Methods of Providing Cement Bases for Hy-Rib Partitions.

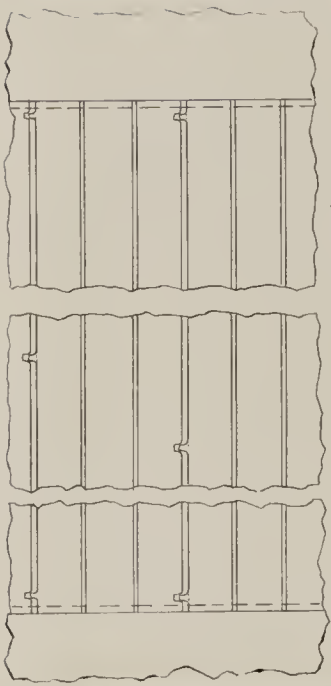
Where the cast bases are used as in the Portland Y. M. C. A. on page 71 the **Hy-Rib** sets in groove at top. In the other method the cement finish is plastered to proper thickness on one side of the **Hy-Rib**. The temporary bracing strip is then removed and other side finished. Plaster is applied to the **Hy-Rib** above the base to a total thickness of two inches.

Polo Grounds, National Baseball League, New York City.
Snare & Triest Co., Erectors.
Hy-Rib used in all Sidings, Partitions, Ticket Booths, Railings, etc.

National League Baseball Grandstand, Cincinnati, O.
Hy-Rib Concrete Partition Walls around boxes, etc.

Calhoun Bath House, Minneapolis, Minn. Cecil Bayless Chapman, Architect; F. Gottlieb Magney, Associate.
Panels of **Hy-Rib** Partitions are handled as a unit.

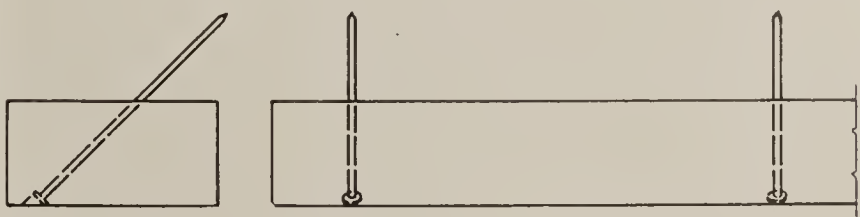
Mausoleum, Detroit Crematorium, Detroit, Mich.
Partitions, niches, columns and beams are **Hy-Rib** Concrete.



Method of Interlocking and Punching Hy-Rib Sheets. (See page 133 for Hy-Rib Punch.)

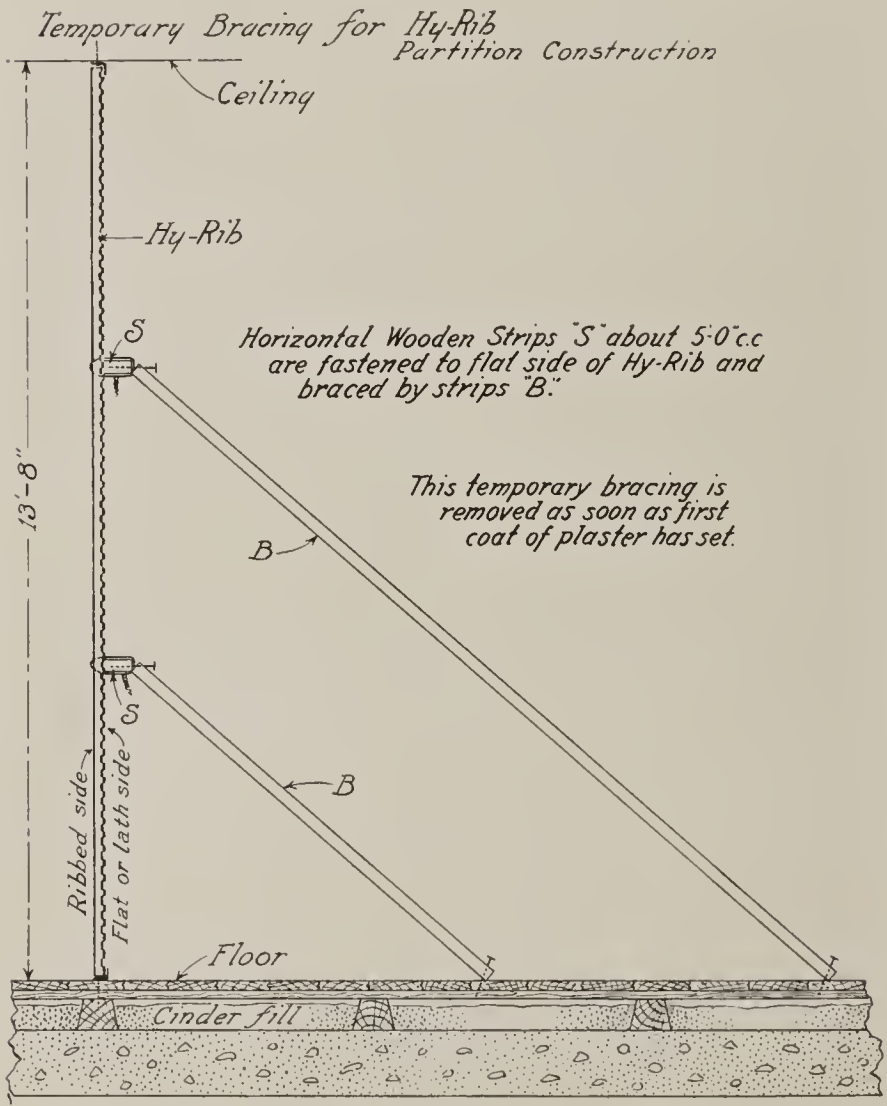
Uniting Hy-Rib sheets by punching interlocked ribs.

Raising Hy-Rib en masse with 2x4 wooden scantling in which spikes are driven as shown below. The ten sheets of **Hy-Rib** have been previously united by punching the interlocked side ribs.



End View. Side View.

2x4 Scantling with spikes driven in slantwise. These spikes engage the **Hy-Rib** mesh permitting a great area of **Hy-Rib** to be raised or hoisted at one operation, as illustrated above.

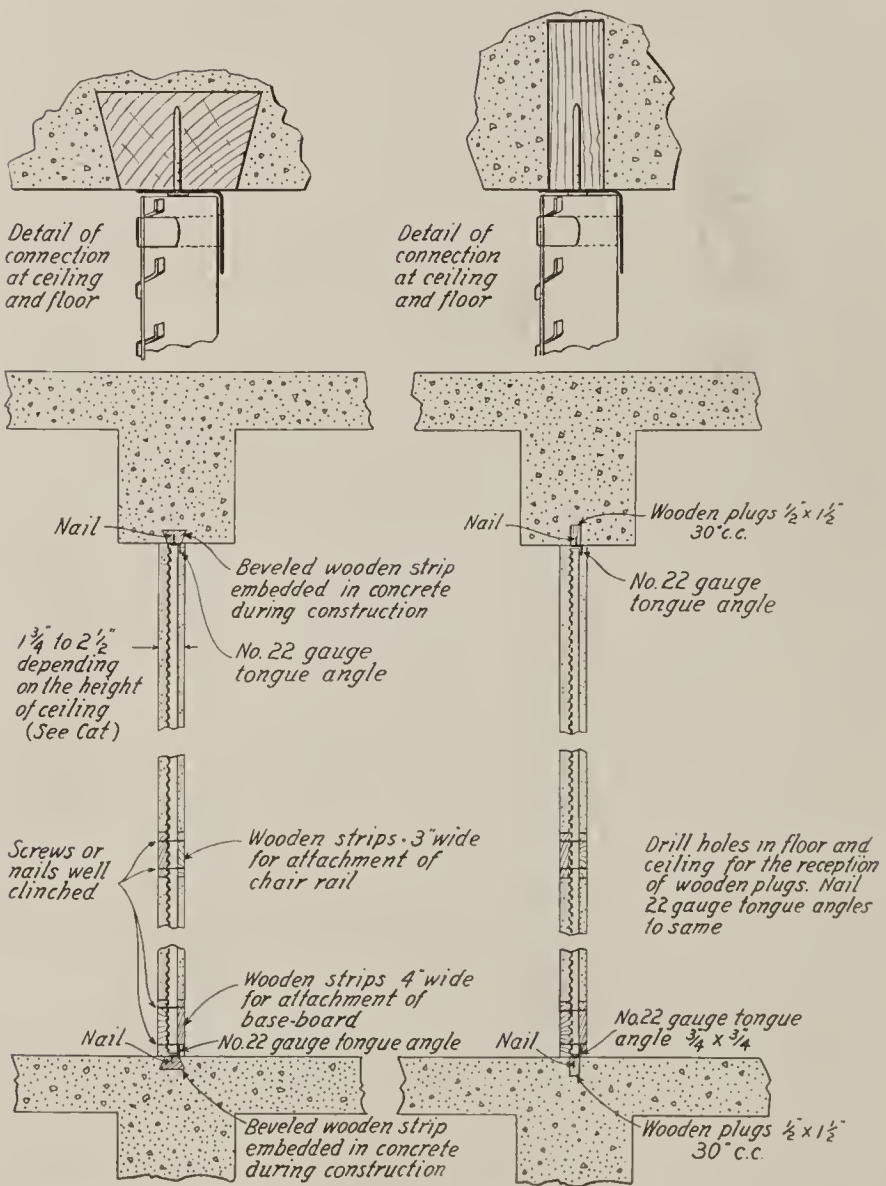


Temporary Bracing for **Hy-Rib** Partition Construction. This bracing is removed after the first coat of plaster, applied to ribbed side, has set. No other bracing is required.

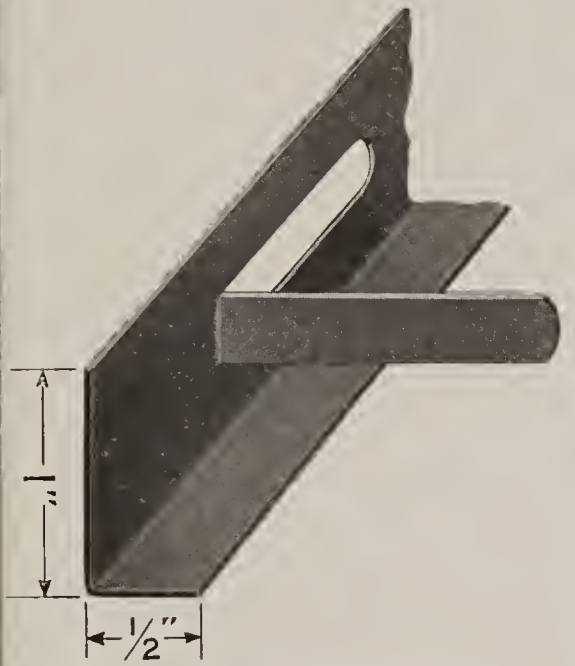
Hy-Rib Partition—Dodge Bros. Power Building, Detroit, Mich.
Note simplicity of temporary

Method of fastening during construction by attaching beveled strips to forms.

Method of fastening after concrete is poured by drilling holes for wood plugs.

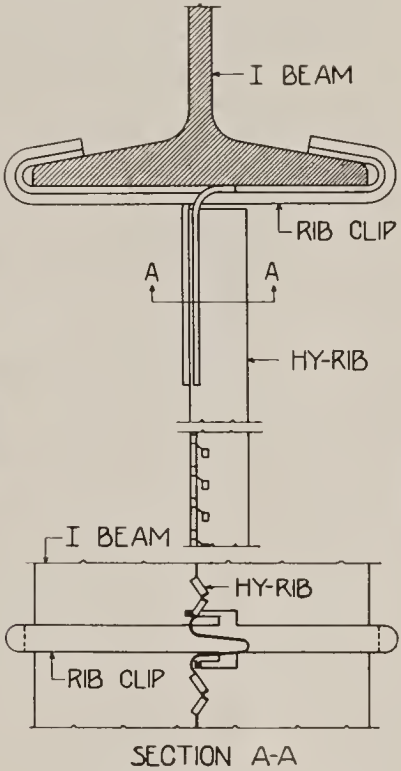


HY-RIB Partitions and Method of Attaching to Reinforced Concrete Construction.



22 Gauge Tongue Angles

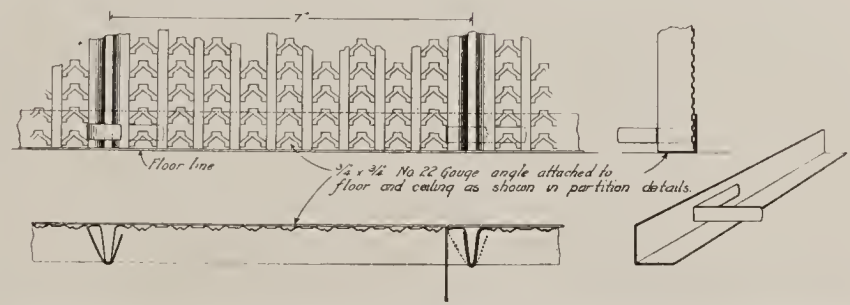
For attaching **Hy-Rib** in partitions and walls. Length, 5 feet. Supplied in bundles of 25 angles. Spacings of tongues, 7 or 8 inches.



SECTION A-A

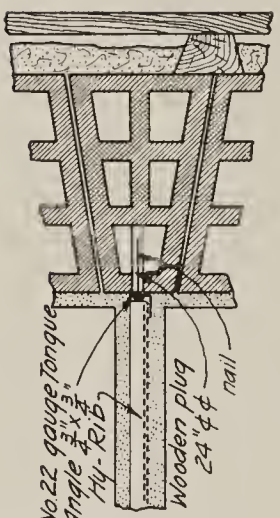
Rib Clips

For attaching top of **Hy-Rib** partition to steel beam. See also Rib Clips, page 99.

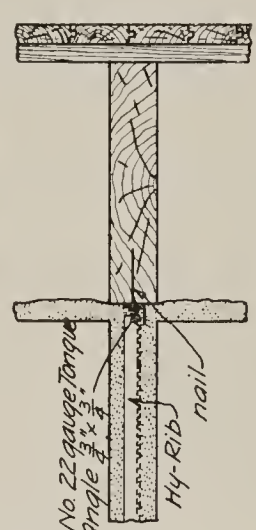


Application of 22 Gauge Tongue Angle at Bottom of Partitions and Walls.

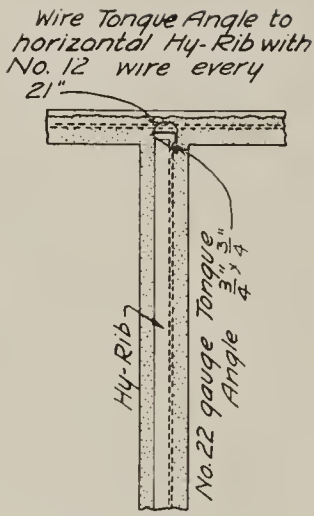
Details for application at top and sides are similar.



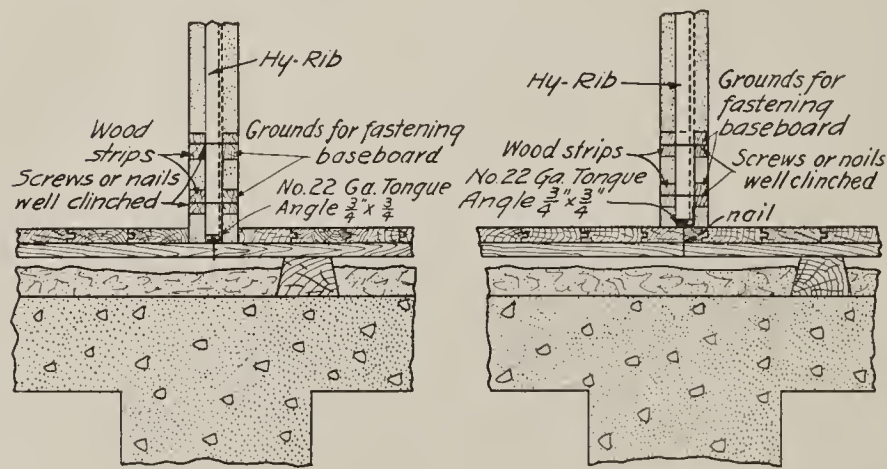
Sketch showing method of erecting Hy-Rib partition in connection with Hollow Tile floors



Sketch showing method of erecting Hy-Rib partition in connection with wood joists

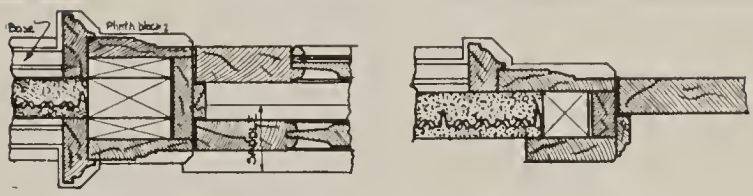


Sketch showing method of erecting Hy-Rib partitions in connection with suspended ceilings.

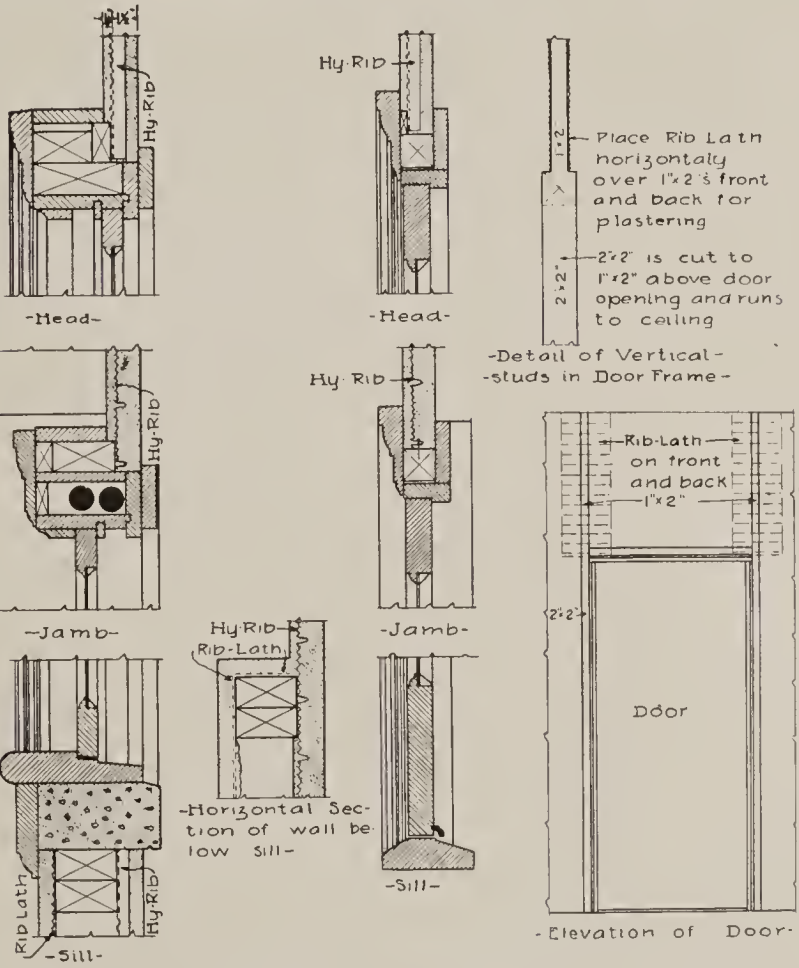


Two methods of fastening Hy-Rib Partition to wooden floors

Method of Attaching Hy-Rib Partitions at Ceiling and Floor.



Detail of Door Framing for Hy-Rib Partition.

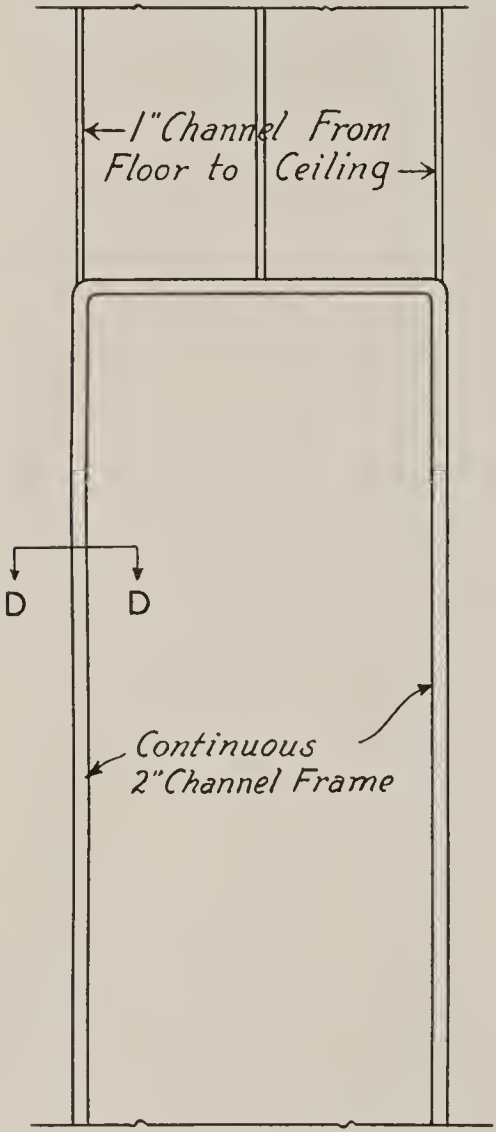


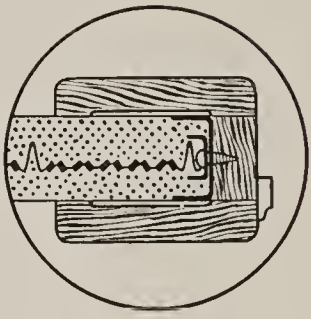
-DETAILS OF WINDOW-
-FRAMING-

-DETAILS OF DOOR-
-FRAMING-

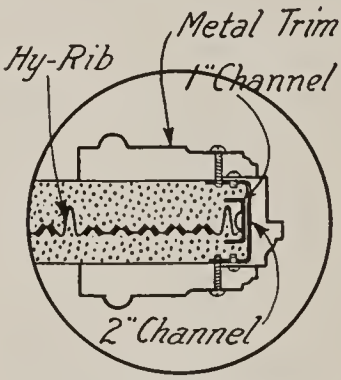
-FRAMING DETAILS OF 2" HY-RIB WALLS & PARTITIONS.-

Methods of Building Wooden Door and Window Frames into Hy-Rib Partitions or Walls.





Cross Section at D-D
with Wood Trim



Cross Section at D-D
with Metal Trim

Fireproof Door Frame in Hy-Rib Partitions

The frame is entirely of steel, eliminating all wood work and leaving absolutely nothing that can burn in the partition. The steel channel may be tapped, punched or drilled to attach wood or metal trim, door stops, hinges, locks, etc. Our Pressed Steel Channel Sections can be used to advantage in building up this frame work.

Specifications for Solid Hy-Rib Partitions

Provide **Hy-Rib**, Type ...., Gauge ...., for all solid partitions. Interlock all adjoining sheets of **Hy-Rib** at sides and ends. Sheets shall be securely fastened together every 24 inches along the sides and at every rib at the ends by wiring or by clinching of the lapped ribs with special punch. Where sheets are spliced at the ends, splices in adjacent rows must be at least 2 feet apart, and must lap from 3 to 6 inches depending upon the height of the partition.

Hy-Rib shall be attached to floors and ceilings by means of small angles (or channels, or wooden strips) as indicated in details.

Where cement plaster is used provide 7/32 or ¼ inch rods, spaced 30 inches on center, at right angles to the ribs. Where lime or patented plasters are used, rods are unnecessary.

Partitions Reinforced with Hy-Rib

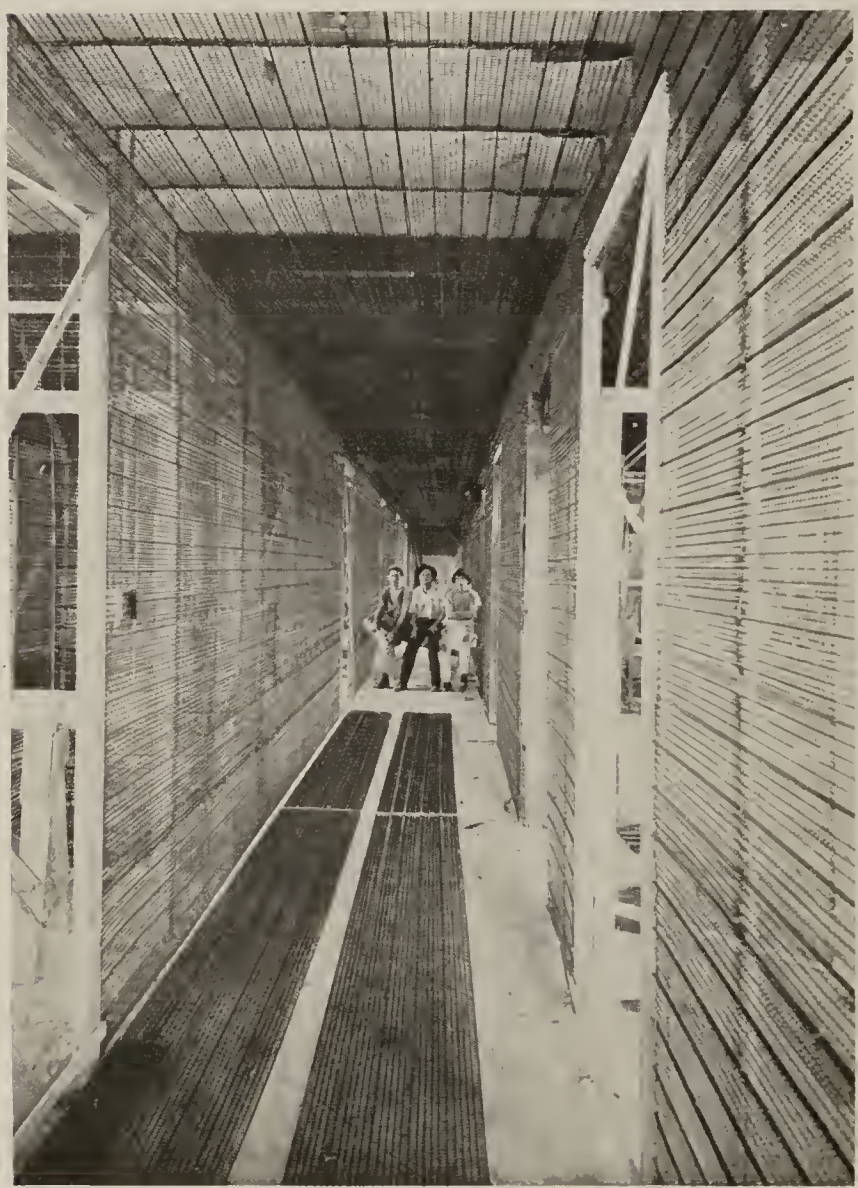
(Minimum Requirements.)

(Ribs of **Hy-Rib** running vertically.)

Height of Partitions	Thickness of Partitions	REINFORCEMENT
up to 10 feet	1¾″	No. 28, $\frac{13}{16}$″ **Hy-Rib.**
12 feet	2″	No. 26, $\frac{13}{16}$″ **Hy-Rib,** or No. 28, $\frac{15}{16}$″ **Hy-Rib.**
14 feet	2¼″	No. 24, $\frac{13}{16}$″ **Hy-Rib,** or No. 26, $\frac{15}{16}$″ **Hy-Rib.**
16 feet	2½″	No. 26, $\frac{15}{16}$″ **Hy-Rib.**
18 feet	2¾″	No. 24, $\frac{15}{16}$″ **Hy-Rib.**
20 feet	3″	No. 22, $\frac{15}{16}$″ **Hy-Rib.**

Temporary bracing should be used horizontally every 5 ft. for $\frac{13}{16}$″ **Hy-Rib** and 6 ft. for $\frac{15}{16}$″ **Hy-Rib.**

For partitions above 25 feet high, structural supports should be erected vertically in accordance with Side Wall Table, page 63, and the **Hy-Rib** run horizontally. Also in special cases partitions above 12 ft. which will be subjected to constant vibration, such as in factories, may have to be constructed in the same manner.



Hy-Rib Lath throughout interior for partitions and ceilings, Plaza Hotel, Dallas, Texas.

Guidera & Bell, Owners, Architects and Contractors.

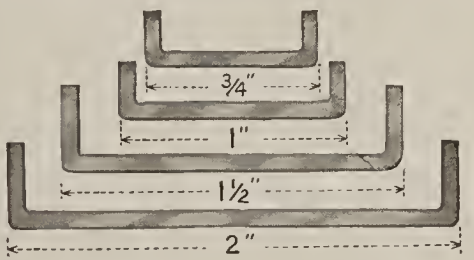
Kahn Pressed Steel Studs

Kahn Pressed Steel Channels without Prongs, furnished in sizes indicated below, are extensively used in solid partitions, ceilings, furring, etc.

Kahn Pressed Steel Studs with Prongs, furnished in various shapes and sizes as indicated on pages 88 and 89, are used in walls, partitions, furring, ceilings, etc.

Kahn Pressed Steel Hollow Studs shown below are formed of two ¾" pressed steel channels held rigidly together by spacing clips. We can supply the Hollow Studs assembled, but spacing clips can be readily attached to the channels on the job. Kahn Hollow Studs are very rigid, yet are open so as to permit rapid wiring of the **Hy-Rib** or **Rib Lath,** and allow passage of conduits in all directions.

Kahn Pressed Steel Channels.

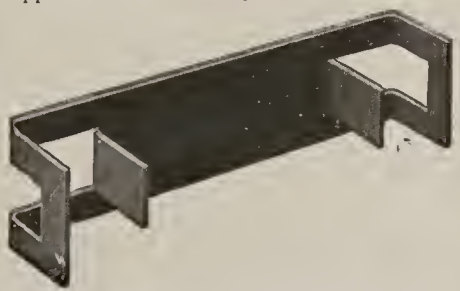


Kahn Pressed Steel Channels without Prongs

No. 16 Gauge

SIZE	¾"	1"	1½"	2"
Weight in lbs. per lineal foot	.276	.332	.442	.553

Stock lengths—12, 14, 16, 18 and 20 feet.
Shipped in bundles of 25 channels.



Spacing Clip as furnished for building up Kahn Hollow Studs on the job.

Standard Widths—Outside dimensions, 2 in., 3 in. and 4 in. Other widths can be furnished on special order.

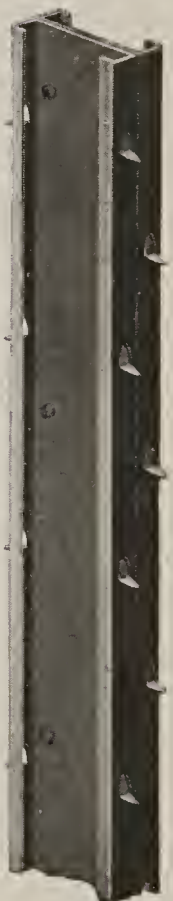
Kahn Hollow Studs are also furnished completely assembled by our factory.

Kahn Hollow Studs as used in hollow partitions.
Made of two ¾ inch pressed steel channels united by spacing bars.

Kahn Pressed Steel Studs with Prongs

2″ Channels

3″, 4″, 5″ and 6″ Channels



3″, 4″, 5″ and 6″ H-Studs

Cap and Sill Plates, for 2″, 3″, 4″, 5″ and 6″ Studs

KAHN PRESSED STEEL CHANNEL STUDS WITH OR WITHOUT PRONGS.

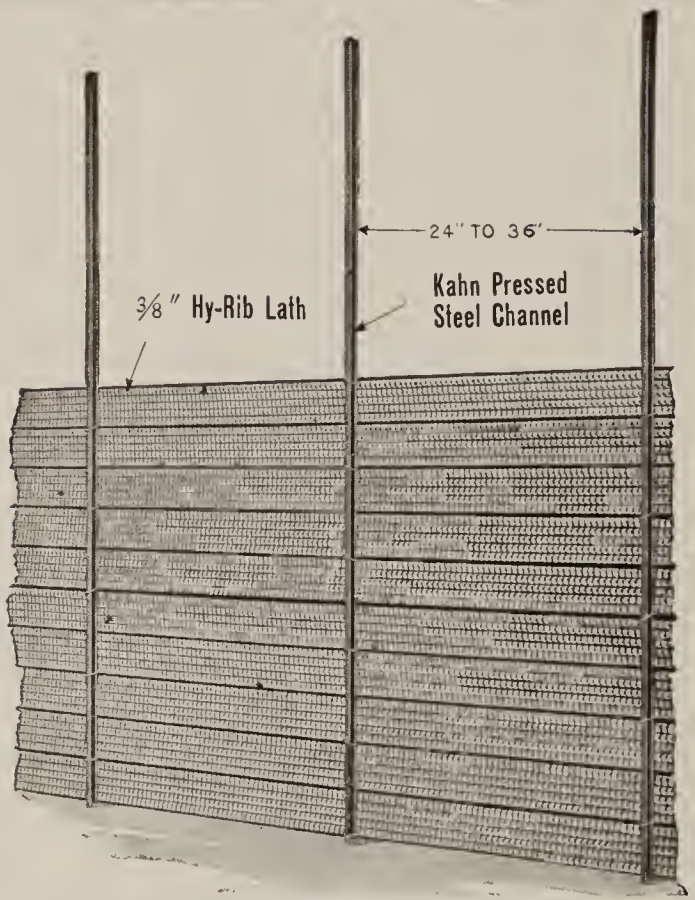
Section Index		Height inches	Width of Flange inches	Weight per lin. foot lbs.	Thickness of Flange and Web, inches	
					Decimal	Fractional
C-62	16	6	2	2.19	.0625	1/16
	14			2.74	.078125	5/64
C-52	16	5	2	1.98	.0625	1/16
	14			2.48	.078125	5/64
C-41½	16	4	1½	1.56	.0625	1/16
	14			1.95	.078125	5/64
C-31½	16	3	1½	1.35	.0625	1/16
	14			1.69	.078125	5/64
C-21	16	2	1	0.78	.0625	1/16

KAHN PRESSED STEEL H STUDS WITH OR WITHOUT PRONGS.

Section Index		Depth of Beam inches	Width of Flange inches	Weight per foot lbs	Thickness of Flange (f)		Thickness of Web (w)	
					Decimal	Fractional	Decimal	Fractional
B-64	16	6	3	4.4	.0625	1/16	.1250	1/8
	14			5.5	.078125	5/64	.15625	5/32
B-54	16	5	4	4.0	.0625	1/16	.1250	1/8
	14			5.0	.078125	5/64	.15625	5/32
B-43	16	4	3	3.1	.0625	1/16	.1250	1/8
	14			3.9	.078125	5/64	.15625	5/32
B-33	16	3	3	2.7	.0625	1/16	.1250	1/8
	14			3.4	.078125	5/64	.15625	5/32

KAHN PRESSED STEEL CAP AND SILL CHANNELS.

Section Index		Height inches	Width of Flange inches	Wt. per Lin. Foot pounds	Thickness of Flange and Web, inches	
					Decimal	Fraction
P-62½	14	6 5/32	2½	2.83	.078	5/64
	11	6¼		4.58	.125	1/8
P-62	14	6 5/32	2	2.58	.078	5/64
	11	6¼		4.17	.125	1/8
P-61½	14	6 5/32	1½	2.32	.078	5/64
	11	6¼		3.75	.125	1/8
P-61	16	6⅛	1	1.64	.062	1/16
P-52½	14	5 5/32	2½	2.58	.078	5/64
	11	5¼		4.17	.125	1/8
P-52	14	5 5/32	2	2.32	.078	5/64
	11	5¼		3.75	.125	1/8
P-51½	14	5 5/32	1½	2.05	.078	5/64
	11	5¼		3.34	.125	1/8
P-51	16	5⅛	1	1.43	.062	1/16
P-42½	14	4 5/32	2½	2.32	.078	5/64
	11	4¼		3.75	.125	1/8
P-42	14	4 5/32	2	2.05	.078	5/64
	11	4¼		3.34	.125	1/8
P-41½	14	4 5/32	1½	1.79	.078	5/64
	11	4¼		2.92	.125	1/8
P-41	16	4⅛	1	1.22	.062	1/16
P-32½	14	3 5/32	2½	2.05	.078	5/64
	11	3¼		3.34	.125	1/8
P-32	14	3 5/32	2	1.79	.078	5/64
	11	3¼		2.92	.125	1/8
P-31½	14	3 5/32	1½	1.53	.078	5/64
	11	3¼		2.50	.125	1/8
P-31	16	3⅛	1	1.02	.062	1/16
P-21	16	2⅛	1	.81	.062	1/16



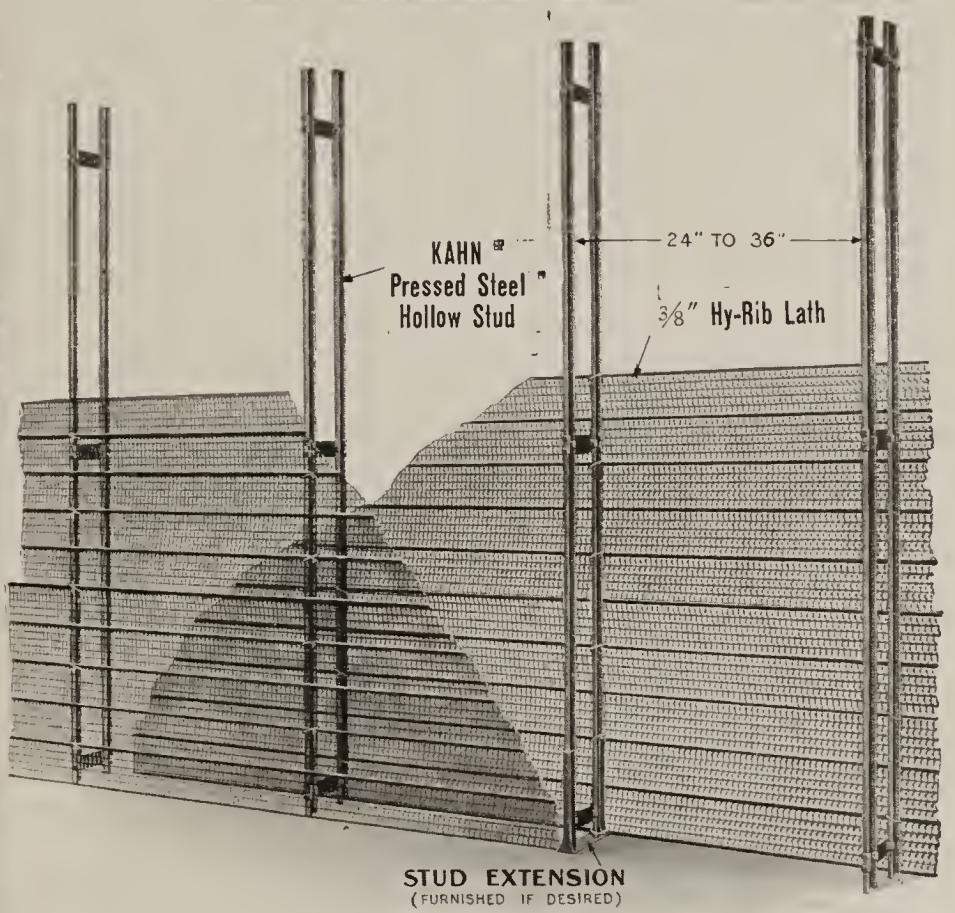
Solid partitions with 3/8" Hy-Rib Lath and widely spaced studs.

Most Economical Construction for Partitions and Ceilings 3/8" Hy-Rib Lath and Widely Spaced Studs

In this money-saving construction, the channels are spaced 24" to 36" centers instead of 12" to 16", required with ordinary metal laths, thus saving one-half the cost of channels, labor and wiring.

In partitions, ceilings and furring, the use of 3/8" **Hy-Rib** Lath with widely spaced pressed steel channels is exceptionally economical, at the same time providing strength, permanence and fireproofness. **Two-coat plaster work is accomplished instead of three.**

3/8" Hy-Rib Lath	Maximum stud spacing for walls and partitions	Maximum spacing of supports for ceilings
24 gauge	36"	33"
26 gauge	32"	30"
28 gauge	24"	22"



Hollow partitions with ⅜" HY-RIB Lath and widely spaced studs.

Hollow Fireproof Partitions with ⅜" Hy-Rib Lath and Widely Spaced Studs

The use of the ⅜" **Hy-Rib** Lath in hollow partitions assures the same economy as in solid partitions. By its use fully half of the studs are saved, with a corresponding saving in wiring and labor. The excellence of the key and the rigidity of the **Hy-Rib** saves labor and material in plastering.

⅜" Hy-Rib Lath	Maximum stud spacing for walls and partitions
24 gauge	36"
26 gauge	32"
28 gauge	24"

Only two coats of plaster are required on ⅜" **Hy-Rib** Lath, where lighter laths require three, thus saving time and labor.

Hy-Rib Ceilings, Bremer Arcade Building, St. Paul, Minn. Buechner & Orth, Architects. Wm. Poppenberger & Sons, Plastering Contractors.

Note method of suspending **Hy-Rib** from reinforced hollow tile floors and heavy first coat of plaster made possible by stiffness, key and true surface of **Hy-Rib.**

Hy-Rib Ceilings, High School, Alliance, O.
Richards, McCarty & Bulford, Archts.

Ceilings

The numerous small stiffening channels and expense of wiring lath to them are eliminated in Hy-Rib ceilings, reducing labor cost by 50% and saving time in erection.

The ribs give exceptional stiffness and rigidity to the **Hy-Rib,** holding it straight and true to line. **Hy-Rib** presents a perfect, flat surface for plastering, requiring a minimum amount of material. The improved form of expansion provides a perfect key for the plaster and prevents its dropping off. Two coat work instead of three can be done on **Hy-Rib,** saving material and labor.

Continuous lines of supports for the **Hy-Rib** sheets are placed from two to five feet apart. These supports may be in the construction itself, as in the case of the ceiling attached to the under side of steel beams; or lines of channels may be suspended from the construction above.

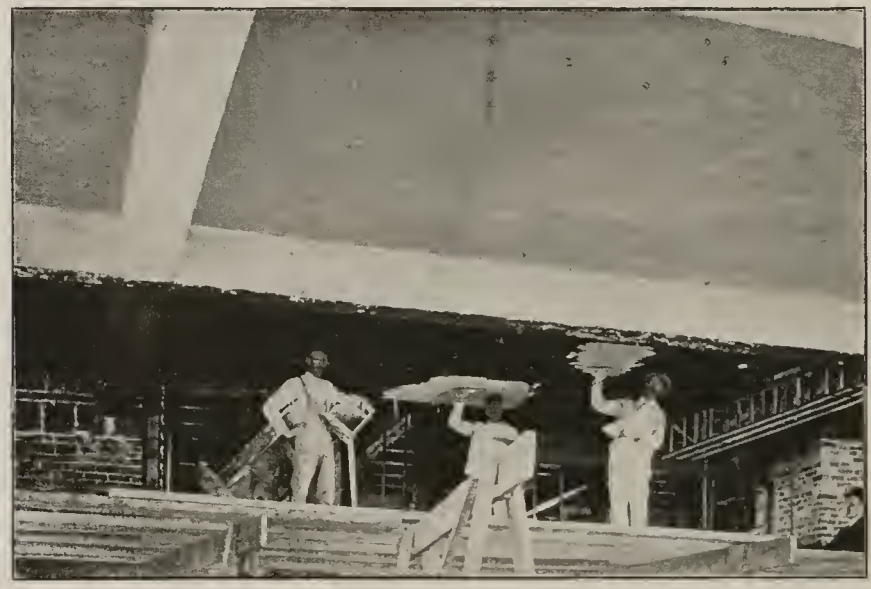
Due to the great strength of **Hy-Rib,** a very rigid surface for plastering is secured, which will not sag under the weight of the plaster nor yield to the pressure of the trowel.

⅜" Hy-Rib Lath Ceiling—Hutchinson High School, Buffalo, N. Y.
H. Osgood Holland, Architect. James G. Davis, Plastering and Lathing Contractor.
Note perfect surface for plastering and wide spacing of supports.

No. 26, ⅜" Hy-Rib on 1" Kahn Steel Channels, 30" Centers.
Crown Building, Cleveland, Ohio.
Forest City Engineering Co., Architects and Engineers.
Masters & Mullen Company, General Contractors.

Hill Memorial Hall, University of Michigan, Ann Arbor, Mich.
Albert Kahn, Architect; Ernest Wilby, Associate.
Hy-Rib and Rib Lath Ceilings, also **Hy-Rib** Roof and Balcony Floor.

Note wide spacing of Channel Supports ready for **Hy-Rib.**



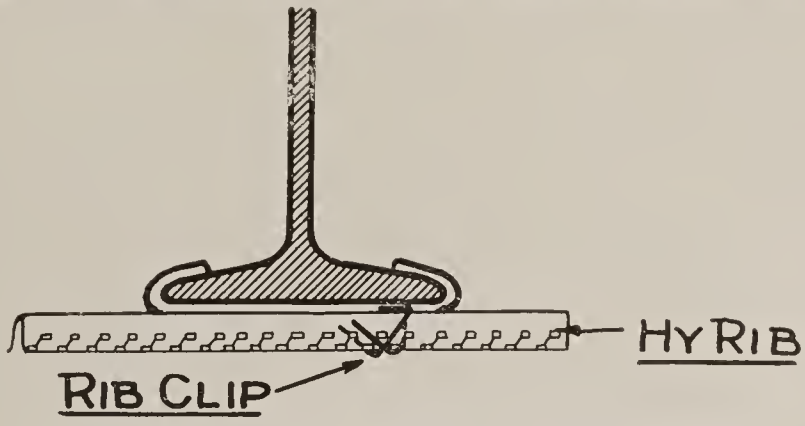
Hy-Rib Ceiling, Hotel Tuller, Detroit, Mich.
Note heavy scratch coat, made possible by extreme stiffness of **Hy-Rib.**

Hy-Rib Ceilings, Mount St. Joseph Academy, Buffalo, N. Y.
A. A. Post, Architect.

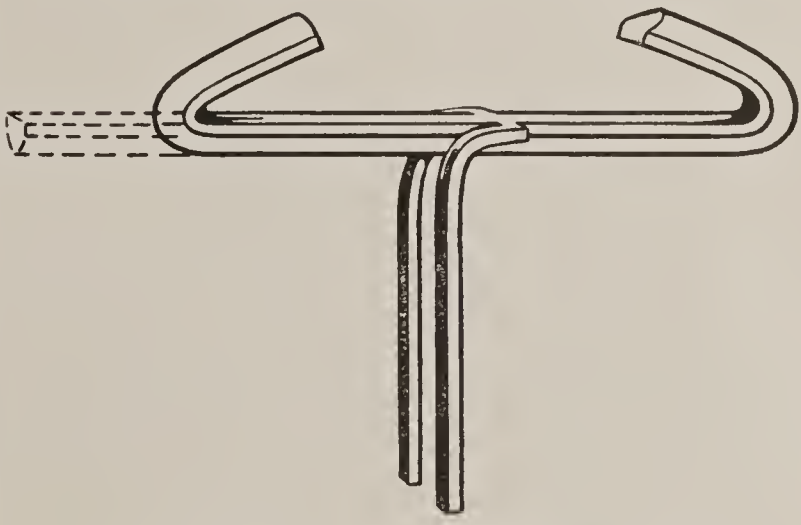
Hy-Rib Suspended Ceiling.
Interstate Telephone Co., St. Paul, Minn.

Germantown High School, Germantown, Philadelphia, Pa.
Suspended Ceilings of $\frac{1}{8}$" **Hy-Rib.**
J. Horace Cook, Architect; Thomas Reilly, Contractor.

$\frac{3}{8}$" **Hy-Rib Lath** for Ceilings. Garden Court Apartments, Detroit.
Albert Kahn, Architect; Ernest Wilby, Associate.



RIB-CLIP to support HY-RIB in Suspended Ceilings.

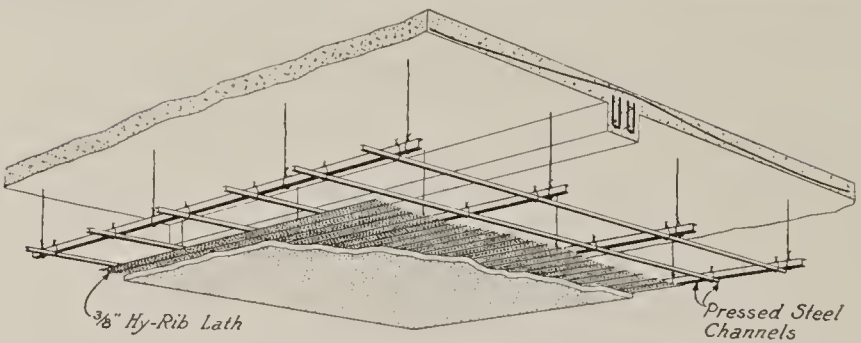


Rib Clips—Price, $1.00 per 100.

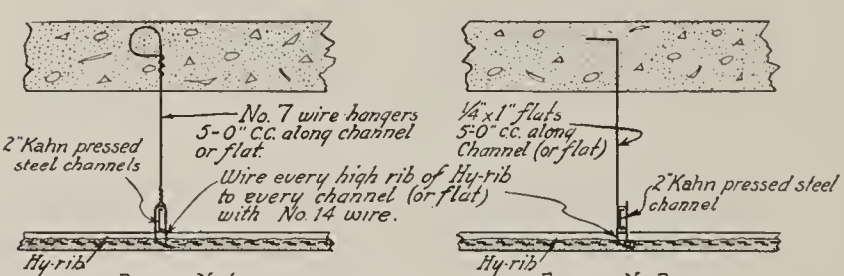
Rib Clips are shipped with one end bent and other end straight as shown by dotted lines. In ordering **Rib Clips**, always give width of flange upon which clips are to be used, or, if this is impossible, give size and weight of Channel or I beam to which the clips are to be attached.

Rib Clips are particularly useful for supporting ceilings as shown above. For use in partitions, see page 81.

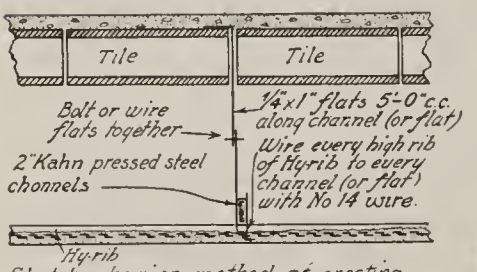
For walls, sidings and roofs, **Plate Clips** (see page 58) are simpler, better and more economical.



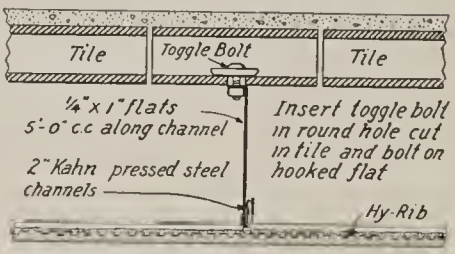
Suspended ceiling of Kahn Pressed Steel Chanels and **Hy-Rib Lath**



Sketch showing method of erecting Hy-rib for suspended ceilings in connection with concrete slabs



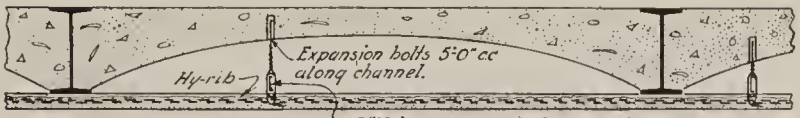
Sketch showing method of erecting Hy-rib for suspended ceilings in connection with tile slabs

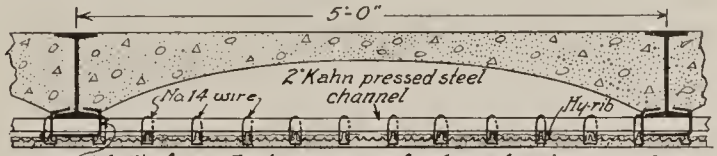


Sketch showing method of erecting Hy-Rib for suspended ceilings in connection with tile slab floors already completed.

HY-RIB Ceilings Suspended from Solid Concrete and Hollow Tile Floors.

If spans are increased, or a live load is placed upon ceiling, materials of a larger size than those here specified must be used.





Sketch showing methods of erecting Hy-rib for suspended ceilings in connection with arched soffits of floors when supporting floor is already completed.

If spans are increased, or a live load is placed upon ceiling, materials of a larger size than here specified must be used.

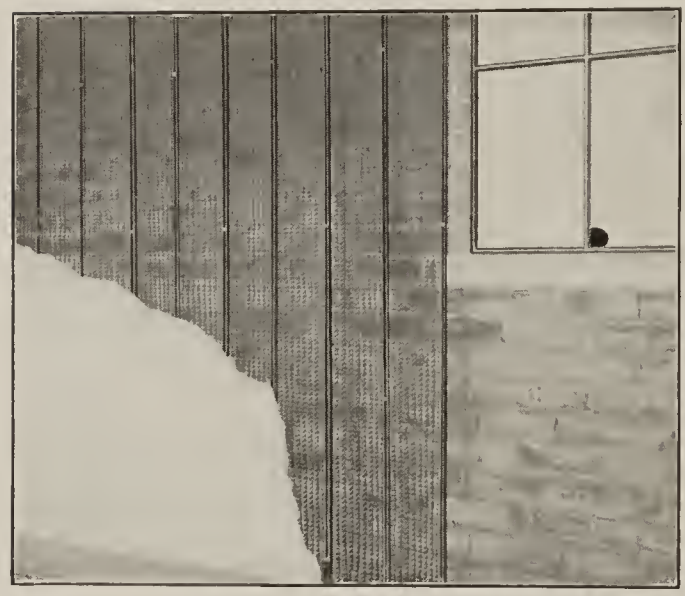
Specifications for Suspended Ceilings

Suspended ceilings shall be built of **Hy-Rib** attached to lines of supports, as indicated in detail; supports to be Kahn Pressed Steel Channels, with following spacing and **Hy-Rib:**

Spacing of Supports	REINFORCEMENT
1'-10"	No. 28, 3/8" **Hy-Rib.**
2'- 6"	No. 26, 3/8" **Hy-Rib.**
2'- 9"	No. 24, 3/8" **Hy-Rib.**
2'-11"	No. 28, 13/16" **Hy-Rib.**
3'-11"	No. 26, 13/16" **Hy-Rib** or No. 28, 15/16" **Hy-Rib.**
4'-11"	No. 24, 13/16" **Hy-Rib** or No 26, 15/16" **Hy-Rib.**
5'-11"	No. 24, 15/16" **Hy-Rib.**

Each high rib of **Hy-Rib** shall be attached at each support.

Place **Hy-Rib** with the flat side downward. Interlock all adjoining sheets of **Hy-Rib** at sides and ends. Sheets shall be securely fastened together every 24 inches along the sides and at every rib at the ends by wiring or by clinching of the lapped ribs with special punch. Where end splices occur between supports, splices in adjacent rows must be at least 2 feet apart. Allow a lap of 2 inches where splices occur over supports, otherwise 8 inches.



Furring

All furring strips are eliminated by the use of **Hy-Rib**. For furring inside or outside of walls, **Hy-Rib** is nailed or stapled directly to the wall with the lath side outward, eliminating entirely the expense of attaching lath to furring strips. Two coats of plaster instead of three can be applied to the **Hy-Rib**, saving labor and plaster.

Where an air space is necessary for insulation against dampness and temperature, either $\frac{13}{16}$″ or 1½″ **Hy-Rib** should be used, securing in this way an air space of either $\frac{13}{16}$″ or 1½″ as desired. Where the furring is only desired as a key for the plaster, ⅜″ **Hy-Rib Lath** is entirely ample.

Hy-Rib is extensively used as a furring for insulation around boilers, in cold storage plants, and on roofs to prevent condensation. The air space between the ribs stops the conduction of heat, cold and moisture.

Specifications for Furring

Hy-Rib shall be placed with the lath side away from wall. It shall be fastened to the wall by means of staples or nails occurring every 36 inches along the length of each high rib, points of fastening being staggered in adjacent rows. Interlock all sheets at ends and sides and allow 1 inch end lap.

Alt Heidelberg, Fort Wayne, Ind. J. M. E. Reidel, Architect. Stucco on **Hy-Rib** used as Furring on Brick Wall.

Hy-Rib Concrete Residence—Dr. Terriberry, Fisher's Island, N. Y.
James Sweeney, Architect.

Hy-Rib Residence for Miss Alice Henck, Santa Barbara, Cal.
Thomas Nixon, Architect.

Industrial Buildings

In Factories, Warehouses, Foundries, Machine Shops, Rolling Mills, Car Barns, Round Houses, Power Plants, Elevators—in fact, industrial buildings of all kinds, **Hy-Rib** is used extensively for sidings, floors and roofs. The cement finish gives a good, clean-cut, business-like appearance to the building. The total absence of expense for repairs makes it far more economical than the old style corrugated iron sheets or wooden sheathing.

Business Buildings

In Office, Store and Public Buildings, **Hy-Rib** finds its principal uses in partition, ceiling, floor and roof construction. Thin solid partitions less than 2 inches in thickness and of great rigidity are obtained by using **Hy-Rib**. The size of offices is increased from 4 to 6 inches by the small space occupied by these thin partitions. Such partitions are strictly fireproof and in this way buildings can be subdivided into fireproof compartments, which prevent the spread of fire.

Partitions built of **Hy-Rib**, besides possessing greatest strength, are the lowest in cost of any strictly fireproof method of building and are built more rapidly and with less labor.

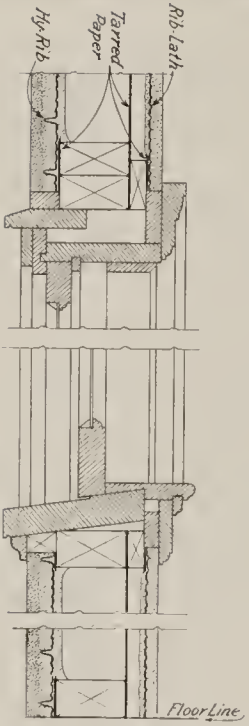
Residences, Garages and Small Buildings

The advantages of using **Hy-Rib** and Rib Lath in residences and small buildings are:

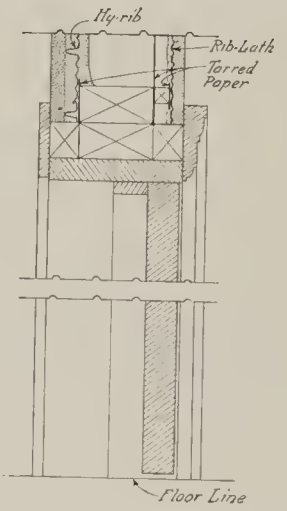
1. Practically fireproof, due to the heat-resisting qualities of the two-inch reinforced concrete slab on outside.
2. Absolutely waterproof and dampproof.
3. Easy to heat in winter and keep cool in summer, owing to the double air space in the wall.
4. Practically indestructible, owing to the permanence of the reinforced concrete wall.
5. No expense for maintenance, such as painting, repairs, etc.
6. Unusual architectural beauty, because of the artistic effects that can be secured with stucco.
7. Low first cost.

Details of Exterior Walls of Residences

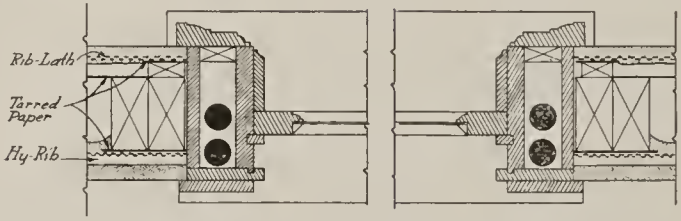
Showing Hy-Rib on outside and Rib Lath on inside.



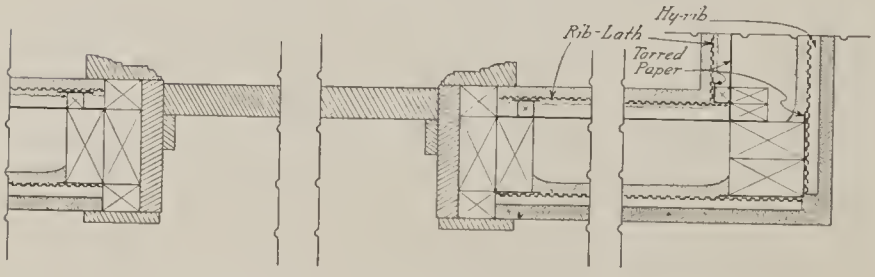
Vertical Section Through Window.



Vertical Section Through Outside Door.



Horizontal Section Through Window.



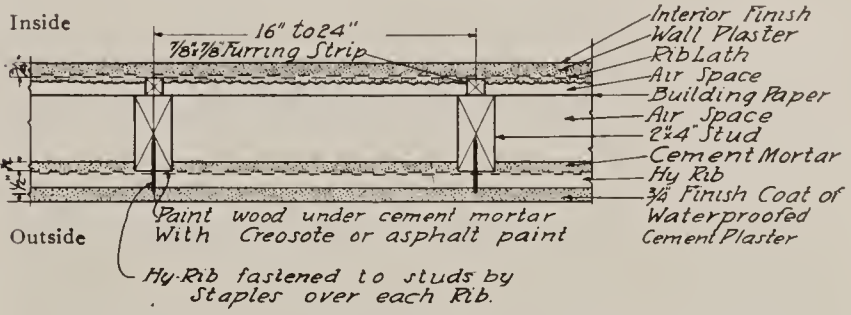
Horizontal Section Through Outside Door.

The building of concrete residences and smaller buildings has long been popular, owing to their permanence, fireproofness, and unusual possibilities for artistic treatment. The cost has been the one item which has hindered a more universal adoption of this type of building.

The cost of lumber, field labor, and special contrivances necessary to carry on the ordinary type of concrete construction makes such work expensive in small buildings. **Hy-Rib** does away entirely with all forms and special work, greatly reducing the cost.

For small buildings such as garages, sheds, barns, etc., a single thickness wall of **Hy-Rib** plastered with cement is ample. To carry the floor and roof loads provide occasional posts built up of steel members, wooden scantling, or reinforced concrete. **Hy-Rib** is attached rigidly to the posts by means of **Hy-Rib** clips, wires, or staples.

For dwelling houses an air space should be provided in the outside wall. The following method for constructing stucco walls, will give by far the best results, although the other methods outlined are satisfactory:



Cross-Section showing Construction of Exterior Walls.

Set up an ordinary "balloon" frame structure with 2x4 studding spaced 16 to 24 inches apart, and put all temporary bracing on the inside. Fasten **Hy-Rib** at each rib to outside of studs with staples or nails. Use $\frac{3}{8}$" or $\frac{13}{16}$" **Hy-Rib** with ribs extending horizontally and lath surface

Various stages in overcoating frame building, showing ⅜" **Hy-Rib Lath** before plastering, after one plaster coat and finished stucco. No furring required for ⅜" **Hy-Rib Lath.**

Residence of N. J. Spaulding, Ionia, Mich.
An Old Wooden House Transformed into a Modern, Permanent Residence by Overcoating with **Hy-Rib** and Stucco.

against studs. Interlock sheets at sides and ends, securely wiring or clinching them at sides and ends. Paint the studs with creosote or asphalt paint along the entire outer face, and at least an inch back on the sides. Plaster this **Hy-Rib** on the outside with cement mortar (mixed and applied as directed on page 62) to a thickness of 1½ inches for $\frac{13}{16}$" **Hy-Rib,** or 1 inch for ⅜" **Hy-Rib** Lath. The surface can be given any finish desired. The last coat of plaster finish should be waterproofed with Trus-Con Waterproofing Paste, Concentrated. Then back plaster the **Hy-Rib** with similar mortar to a thickness of about half an inch.

This construction insures absolute protection for the steel, and when the mortar has set you have a 2-inch reinforced concrete slab, solid as rock, and much stronger and more rigid than the ordinary matched sheathing and lap siding of which it has taken the place.

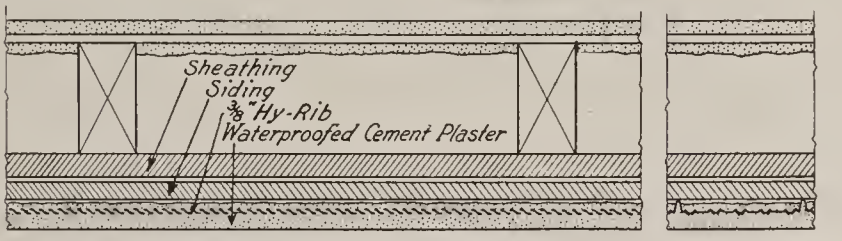
On the inside of the studding tack thin asbestos board or a very heavy tarred paper, then ⅞-inch furring strips, and Rib Lath, on which apply ⅝-inch of cement mortar or good plaster (free from pure gypsum) and the regular finish coat.

The method outlined above gives a monolithic reinforced concrete wall of extreme strength and rigidity. For large buildings $\frac{13}{16}$" **Hy-Rib** should be used, making wall at least 2" thick. For medium sized buildings, use ⅜" **Hy-Rib** Lath, making wall at least 1½" thick. For cottages and buildings in which the total wind pressure will not be great, some saving may be effected by using ⅜" **Hy-Rib** Lath or **Heavy Beaded Plate Rib Lath,** making wall at least 1¼" thick. In this stucco construction it must be remembered that the only way to insure permanence is to have a real reinforced concrete slab on the outside. No lath weighing less than 4¼ lbs. per square yard is strong enough to properly reinforce a concrete wall.

Wonderful transformation of forty-five year old wood frame house to modern stucco residence. 3/8" **Hy-Rib Lath** was applied directly to the old siding without the use of furring strips.
David Stott Estate, 1700 E. Jefferson Ave., Detroit, Mich.
John Shea, Plastering Contractor.

Another method which has been extensively used in our colder climates is to place on the outside of the studding 7/8-inch matched sheathing, heavy building paper, and 3/8" **Hy-Rib Lath,** plastered 1 inch thick with cement mortar properly waterproofed. No furring strips are required.

For our milder climates the furring may be omitted in the first two methods described and the paper sheathing may be omitted in all three cases. This reduces the cost still further. .



DETAILED APPLICATION OF 3/8" HY RIB FOR STUCCO OVER WOOD SHEATHING OR SIDING OF FRAME BUILDING

"Over-Coated" Houses

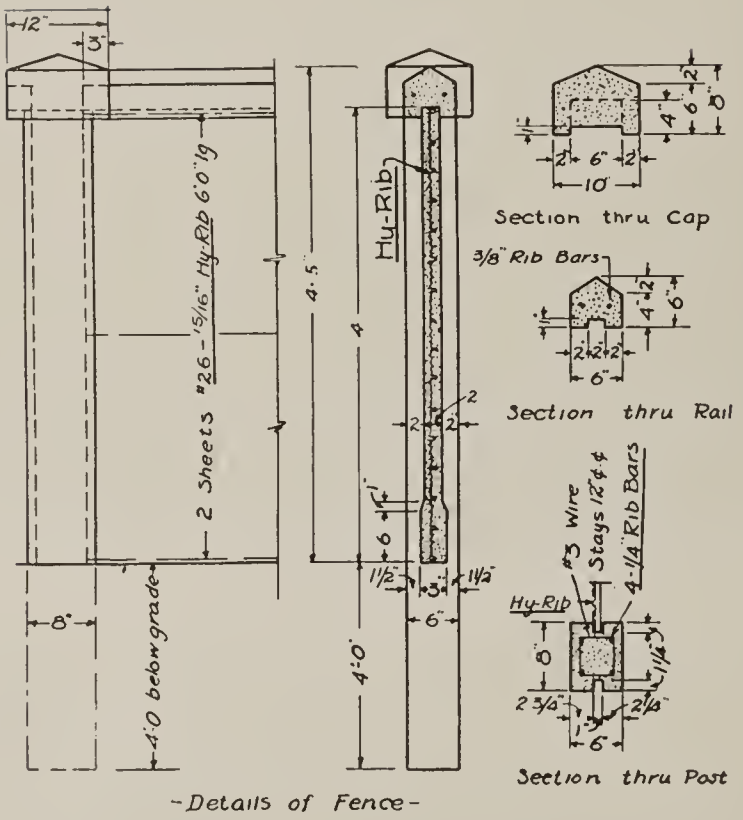
An old wood frame building can be readily transformed at nominal expense into a fine, stucco-finished building by the use of **Hy-Rib** or **Rib Lath.** Wood furring strips are eliminated by the use of **Hy-Rib** which is nailed directly to the siding with the ribs in a horizontal direction.

The cement stucco plaster is applied directly to the **Hy-Rib** or **Rib Lath.** This plaster should be the same as that indicated for building walls and sidings, and the last coat of plaster finish waterproofed with Trus-Con Waterproofing Paste, Concentrated. The last coat may be of a smooth, rough or pebble dash finish, as desired. The transformation made in a house in this way is very wonderful, enhancing the value and life of the property and protecting it against fire.

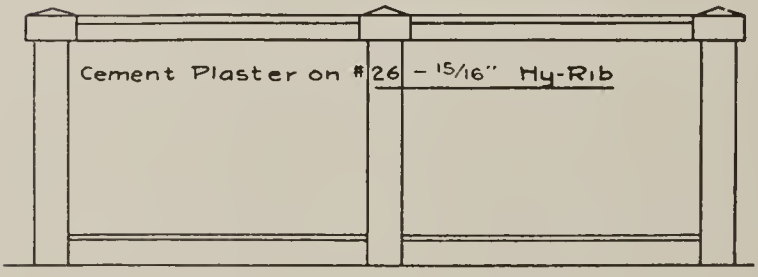
Hy-Rib Garage for T. H. Kane, Youngstown, O.
Ready for Plastering and Completed.

Hy-Rib Garage for W. E. Parker, Grosse Pointe, Mich.

Hy-Rib Garage for Dr. Moran, Detroit, Mich.



-Details of Fence-



-Front Elevation of Fence-

Details of HY-RIB Concrete Fence, with Reinforced Concrete Posts.

Hy-Rib Fence, E. J. Smith, Detroit, Mich.
Note fence is open below.

Hy-Rib Fence, Ernest G. Swift, Detroit, Mich.
Note **Hy-Rib** Garage at Right.

Hy-Rib Concrete Fence, Minneapolis Ball Grounds. **Hy-Rib** sheets are united by punching and placed a panel at a time. Note the great saving in labor by the use of **Hy-Rib** and this method of handling.

On the Farm

Catalogue, "Hy-Rib Concrete Silos and Farm Buildings" sent on request.

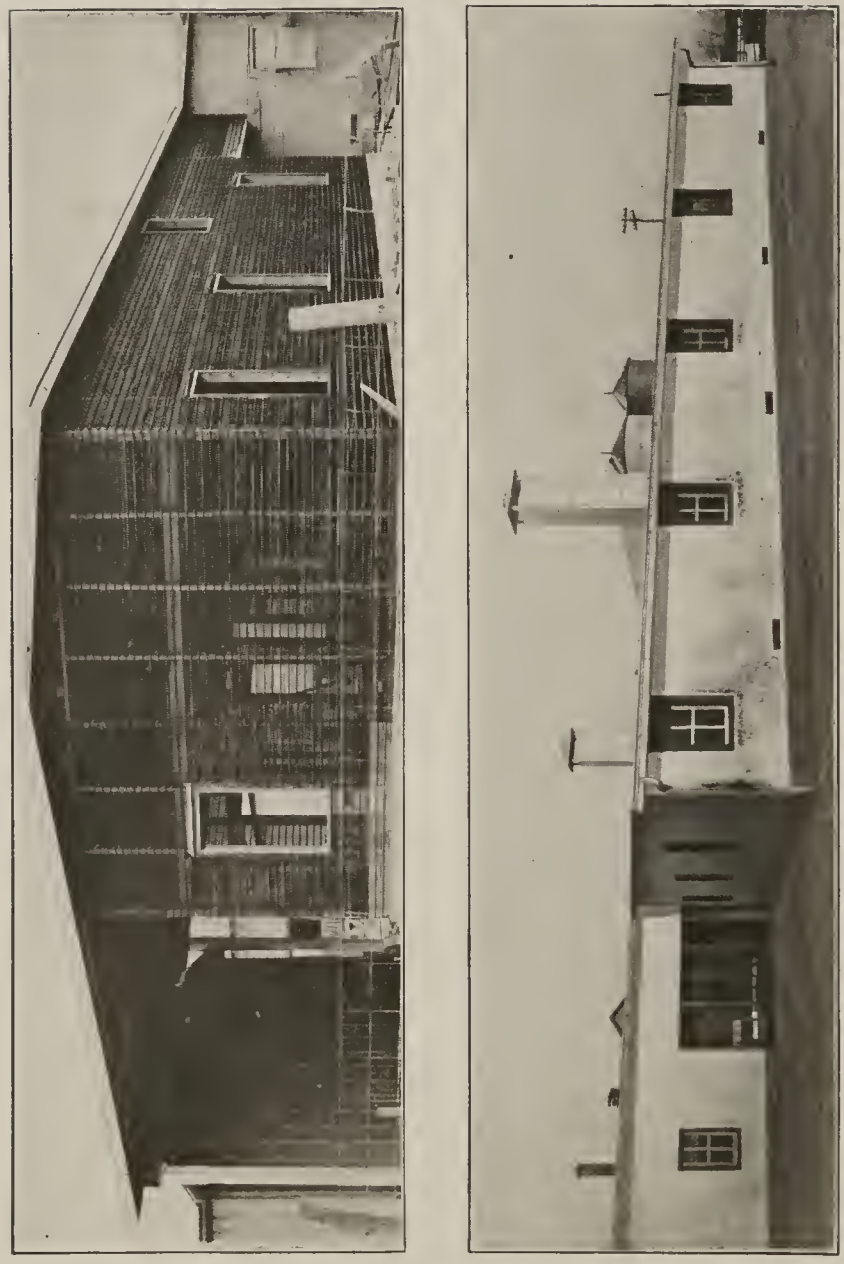
The day of the unsightly short-lived wood frame buildings is passing, and in their place are found modern concrete structures. The average farm is provided with no means of fighting fire, so that the slightest fire may cause the total loss of a large amount of property. Fireproof construction is a necessity in farm buildings.

Hy-Rib, owing to its simplicity and ease of application, makes it possible for concrete construction to be carried on by the ordinary farm mechanic.

The sand and stone for the concrete are easily accessible in the neighborhood—the Portland cement is secured from local dealers. **Hy-Rib** is shipped in exact lengths, and, where desired, bent to any curve. Its uses are found in the building of houses, barns, and sheds of all kinds—in constructing culverts, cisterns, tanks and silos. Fences are also built in this way.

We will gladly supply detailed information in regard to any particular work that may be contemplated.

Hy-Rib Walls, Agricultural and Horticultural Building, State Fair Grounds, Raleigh, N. C.
Frank K. Thompson, Architect and Engineer.



Hy-Rib Concrete Sidings on wood studs, before and after plastering.
Barns on Walker Bros.' Farm, Walkerville, Ont.

Albert Kahn, Architect,
Ernest Wilby, Associate.

"Wabeek Farm," Birmingham, Mich. James Couzens, owner. Creamery and Dairy Barn of Kahn System of Reinforced Concrete. Two **Hy-Rib** Concrete Silos 20′x64′; also **Hy-Rib** Concrete Fences and Partitions.

Hy-Rib Feed Barn and two **Hy-Rib** Silos. Espanore Farm, Lansing, Mich. Ex-Governor Osborn, Owner.

Two 14′x30′ **Hy-Rib** Concrete Silos on the McBride Farm, Burton, Mich.

Hy-Rib Concrete Silos for J. R. Cross Co., Jersey Farms, Fairhope, Ala.

Silos, Tanks, Reservoirs, Cisterns and Chimneys

Write for Catalogue, "Hy-Rib Concrete Silos and Farm Buildings"

The curved **Hy-Rib** sheets are set up on edge and the plaster applied directly to the inner and outer surfaces. No forms of any kind are required. Vertical Rib Bars about 5 feet apart should be used to serve as a guide for the **Hy-Rib** sheets and to thoroughly tie the concrete work together vertically.

Hy-Rib sheets provide in themselves a thorough interlocking splice at the ends and sides. Lap the sheets at least 8 inches at ends and securely fasten together each spliced rib. Splices in adjacent rings should be at least two feet apart.

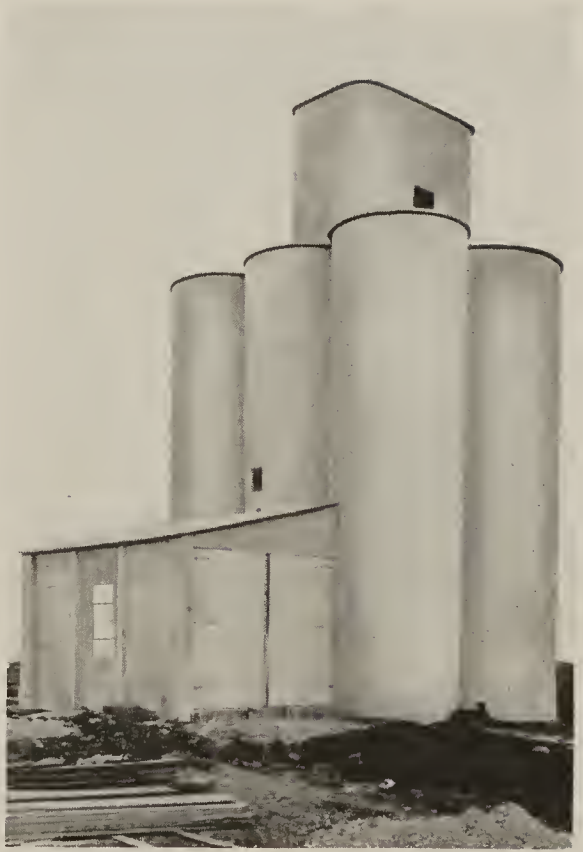
Follow specifications for **Hy-Rib** walls and sidings, page 62, for material and application of plaster.

It is usually difficult to plaster a solid wall to a greater thickness than 4 inches. When heavier solid walls are required we recommend the use of a double layer of **Hy-Rib**, pouring the concrete in between the two sheets.

Where an air space is desired on walls of silos an inner and outer layer of **Hy-Rib** is used with our Kahn Pressed Steel Hollow Studs to separate them. The inner wall is plastered on both sides and the outer wall on the outside only.

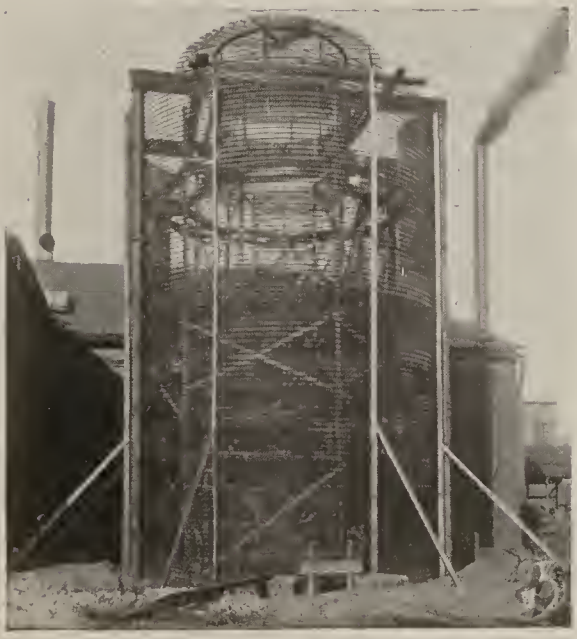
The roof of a silo can also be built of concrete and in this way a permanent silo is secured at a cost but slightly in excess of the ordinary short-lived wood construction.

Construction of 35,000 bushels grain tank for Kuhlman & Meyer Milling Company, California, Mo. Front tank has **Hy-Rib** in place ready for plaster, other two tanks have received two plaster coats. Note steel beams and **Hy-Rib** for roof; also simple scaffolding on inside and outside.



Hy-Rib concrete grain tanks for the Independent Co-operative Grain & Mercantile Company, Stafford, Kansas. The photographs shows the completed tanks one of the many built by the Concrete Steel Machinery Company, Kansas City, Mo.

Hy-Rib Concrete Grain Tank, Shreveport, La. Mr. J. Y. Snyder, Architect.



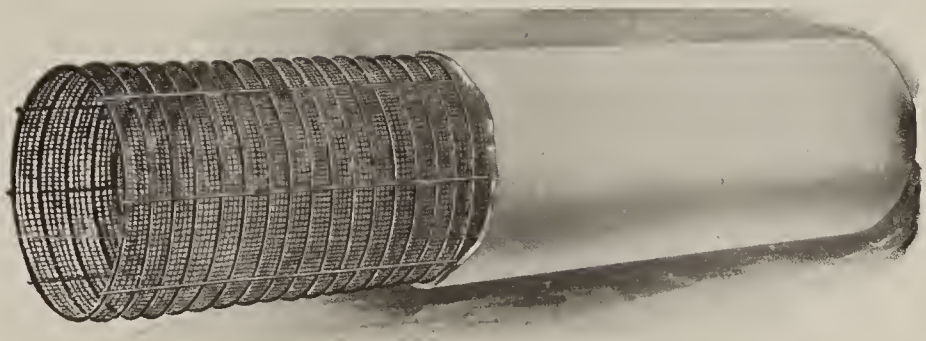
Dust Collector, Owosso Sugar Co., Owosso, Michigan, showing **Hy-Rib** before plastering with cement mortar.

Water Tank (**Hy-Rib**), Jefferson Powder Co., Birmingham, Ala. **Hy-Rib** bent to exact curve in our shops.

20,000 Gallon Tank, Marine Biological Station, San Diego, Cal.
Irving J. Gill, Architect.
Tanks and Panels are built of **Hy-Rib,** Plastered with Concrete.
Posts and Girders are Kahn System Reinforced Concrete.

Hy-Rib Concrete Culvert, Charleroi Mine, Carnegie Coal Co., W. Monessen, Pa.
Note the corrugated metal culvert which has been removed to be replaced by the permanent **Hy-Rib** concrete construction. Only forms required are those at the sides.

Hy-Rib Passageway Connecting Buildings of Wayne County **Insane Asylum, Eloise, Mich.**

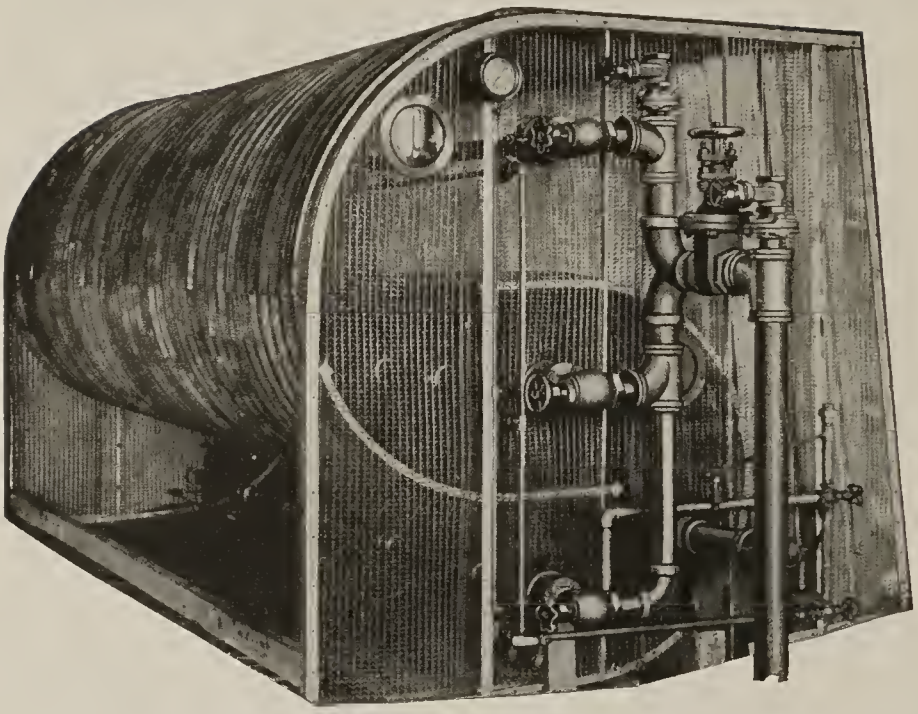


Conduits, Flumes and Culverts

The 15/16" **Hy-Rib** is bent to perfect curve in our shops. Simply set up the curved sheets on the job, and apply the concrete as a plaster.

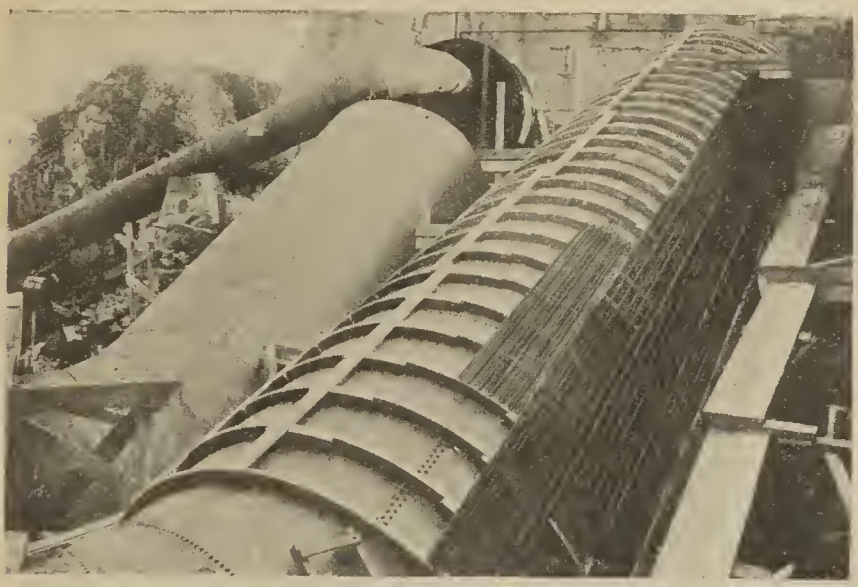
Absolute continuity of reinforcement is secured by the positive interlocking of the sheets at the sides and ends. No forms (the principal item of expense in conduit construction) or special field labor are required. A few rods, as shown on illustration, extending the length of the conduit, should be provided to keep the **Hy-Rib** straight in line and as an additional safeguard against any shrinkage and temperature cracks. Rib Bars are recommended for this purpose.

Either side of the **Hy-Rib** may be plastered first.



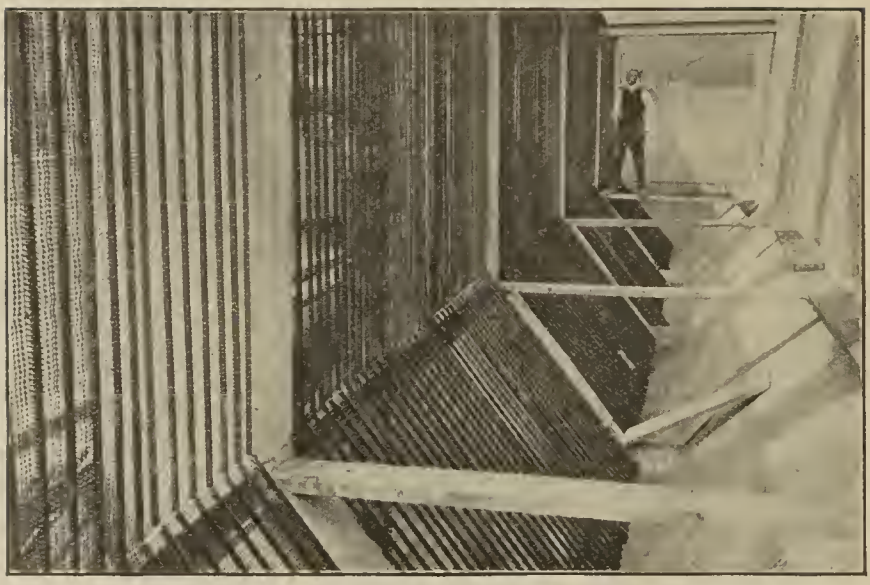
Air Washer made by McCreery Engineering Co., Toledo, O.
Curved **Hy-Rib** Ready for Plastering.

Water-Flume for the Cia. Azucarera del Panuco, El Higo, Mex.
Hy-Rib ready for Concreting.



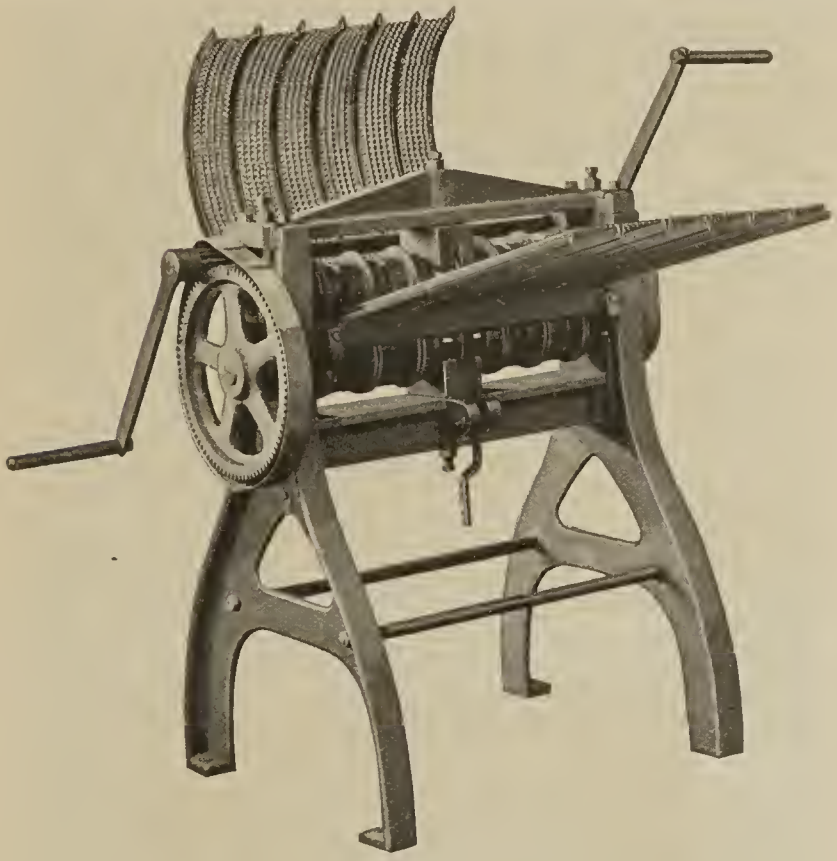
Protecting Steel Penstock with thin **Hy-Rib** Concrete Shell
Applied to wood strips spaced 18" centers. This method eliminates heavy concrete casing and expensive forms. Oliver Iron Mining Co., Quinnesec Falls, Iron Mountain, Michigan.

Hy-Rib Semi-Circles for Road Culverts, Klang, Federated Malay States.



Hy-Rib in Concrete Walls of Imhoff Tank, Altoona, Pa.
Geo. W. Fuller, Consulting Engineer.

Switchman's or Gate Tender's House Built with **Hy-Rib** Walls and Roof. Northern Pacific Terminal Co., Portland, Ore.



(Patented.)

Hand-Power Hy-Rib Bender

FOR CURVING 15/16″ HY-RIB.

View shows $\frac{15}{16}$″ Hy-Rib in Machine.

The Hy-Rib Hand-Power Bender is readily operated by two men, so that Hy-Rib can be shipped in straight sheets and curved locally. This saves greatly in freight and crating charges, as curved Hy-Rib bulks largely and is much more expensive to pack and ship than straight sheets.

The Hand-Power Bender curves Hy-Rib to any circular arc with radius greater than 13 inches.

Punching the **Hy-Rib** to engage the holes in the Plate Clips.
For plate clips see page 58.

Hy-Rib Punch

(Patent Applied for)

Length of Handles, 30 inches.

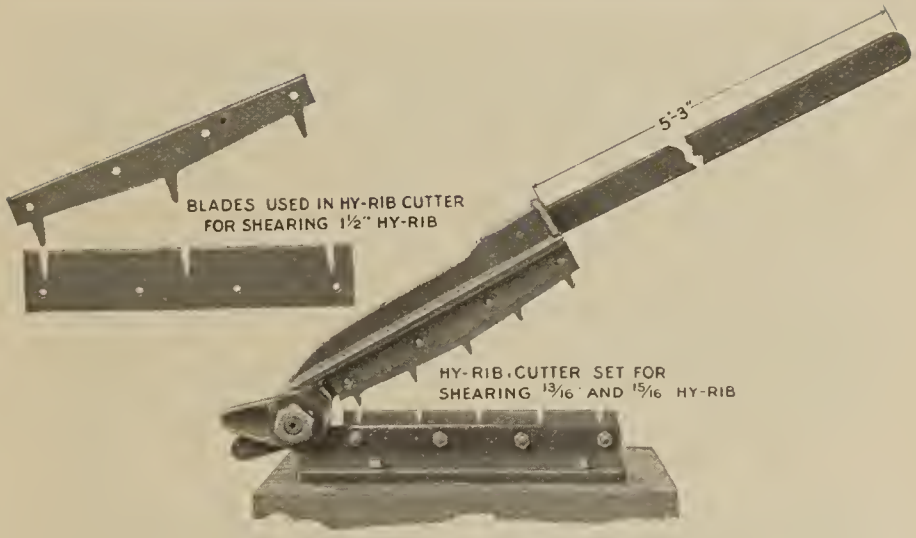
PRICE, $6.00.

The Hy-Rib Punch has two uses; 1st, for fastening the Hy-Rib sheets rigidly together, by merely clamping the interlocked ribs, doing away with all necessity for wiring; 2nd, for punching holes through the ribs, especially when Hy-Rib is attached to steel work by means of the plate clips, thus making a positive attachment between the structural work and the Hy-Rib, and enabling the Hy-Rib to carry maximum loads.

The use of the punch for Hy-Rib sidings is shown on opposite page. The edge of the punch is lined up with the edge of the plate clip, which can be readily seen through the Hy-Rib mesh. The small point of the punch engages in the hole of the clip and thus perfectly aligns the hole in the Hy-Rib with that in the clip. A short piece of wire or a nail slipped through the hole fastens the Hy-Rib rigidly in place. The operation is very rapid and simple, and much less expensive that wiring Hy-Rib to steel work.

On roofs the punch is used similarly and allows the operator to stand erect while working.

SHEARING SHEET OF 13/16" HY-RIB WITH HY-RIB CUTTER. Also shears 15/16" Hy-Rib without change and 1½" Hy-Rib by substituting another set of blades.



(Patented.)

Hy-Rib Cutter. Price, $25.00

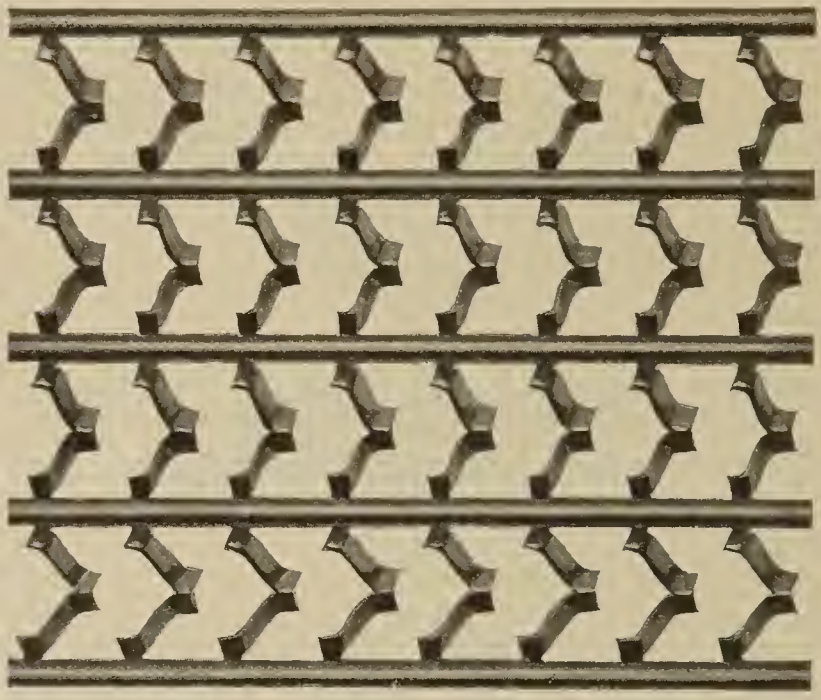
For Shearing All Types of Hy-Rib.

For ordinary work, where **Hy-Rib** must be cut to various lengths, and fitted around openings, most builders find it more economical to order **Hy-Rib** in standard lengths, and cut the sheets to the required size on the job.

The **Hy-Rib Cutter** is a portable shear for cutting **Hy-Rib** sheets to any desired length. It weighs only 85 lbs., and can be readily carried by one man from one location to another. In jobs of any size, the **Hy-Rib Cutter** pays for itself many times over. It saves time, labor and expense over the use of the ordinary tinsmith's tools. Many of our representatives have **Hy-Rib Cutters** which can be rented for use on small-sized jobs.

Hy-Rib Cutters are furnished complete, ready for mounting on suitable base. The shear blades are detachable for sharpening.

The **Hy-Rib Cutter** is designed so as to shear 13/16", and 15/16" **Hy-Rib** with the same blades, and 1½" **Hy-Rib** by merely changing the blades in the cutter. These two sets of blades are furnished with each cutter.



Standard Rib Lath

Medium weight and generally useful in building work.

Size of Sheets—21x96 inches.

Shipped in bundles containing 12 sheets, or 18½ yards.

Grade	Weight per Square Yard	Maximum stud spacing for walls (c. to c.)	Maximum joist spacing for ceilings (c. to c.)
Rib Lath No. 1	2.74 lbs.	14 inches	12 inches
Rib Lath No. 2	3.42 lbs.	16 inches	14 inches
Rib Lath No. 4	4.10 lbs.	18 inches	16 inches

Furnished in Open Hearth or Copper Bearing Steel—All Painted.

"B" Rib Lath

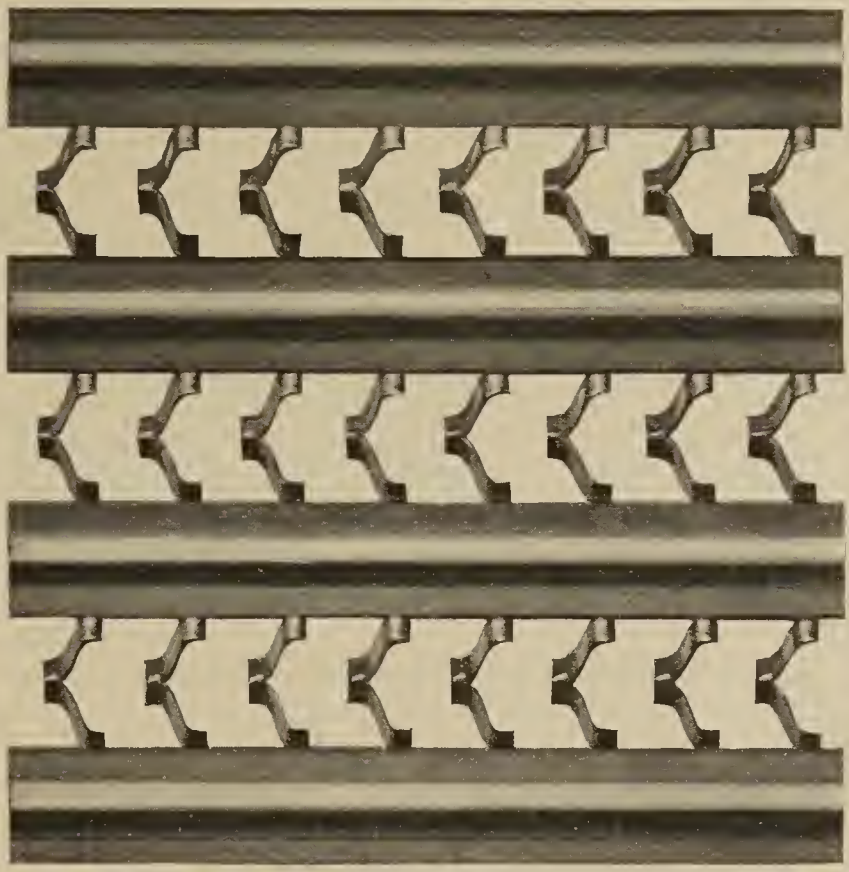
Slightly wider mesh than Standard Rib Lath.

Size of sheets—25x96 inches.

Shipped in bundles containing 10 sheets, or 18½ yards.

Grade	Weight per Square Yard	Maximum stud spacing for walls (center to center)
Rib Lath No. 1B	2.28 lbs.	12 inches
Rib Lath No. 2B	2.85 lbs.	14 inches
Rib Lath No. 4B	3.43 lbs.	16 inches

Furnished in Open Hearth or Copper Bearing Steel—All Painted.



Beaded Plate or "A" Rib Lath

Somewhat heavier than Standard or "B" Rib Lath, but really more economical, as it permits wider spacing of the studs and effects a very great saving in labor and plaster. **Two-coat work can be accomplished on this as contrasted to three-coat work on other metal laths.**

Size of sheets—15⅝x96 inches.
Shipped in bundles containing 16 sheets, or 18½ yards.

Grade	Weight per Square Yard	Maximum stud spacing for walls (c. to c.)	Maximum joist spacing for ceilings (c. to c.)
Rib Lath No. 1A	3.66 lbs.	18 inches	16 inches
Rib Lath No. 2A	4.54 lbs.	20 inches	18 inches
Rib Lath No. 4A	5.45 lbs.	24 inches	22 inches

Furnished in Open Hearth or Copper Bearing Steel—All Painted.

Detroit Diamond Lath

Size of Sheet, 24x96 inches.

Gauge	Sheets per Bundle	Yards per Bundle	Weight per Square Yard PAINTED	Weight per Square Yard GALVANIZED
No. 27	15	26⅔	2.48 lbs.	2.88 lbs.
No. 26	15	26⅔	2.68 lbs.	3.08 lbs.
No. 25	15	26⅔	3.10 lbs.	3.50 lbs.
No. 24	15	26⅔	3.50 lbs.	3.90 lbs.

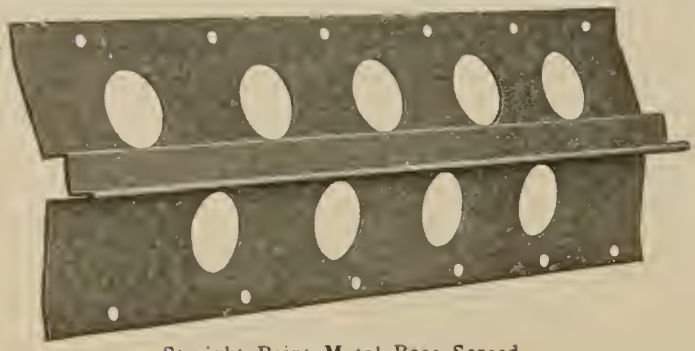
Universal Diamond Lath

Size of Sheet, 28x96 inches.

Gauge	Sheets per Bundle	Yards per Bundle	Weight per Square Yard PAINTED	Weight per Square Yard GALVANIZED
No. 26	14	29	2.30 lbs.	2.70 lbs.
No. 24	14	29	3.00 lbs.	3.40 lbs.

Furnished in Open Hearth or Copper Bearing Steel—
Painted or Galvanized Before Expansion.

Trus-Con Metal Base Screeds



Straight Point Metal Base Screed.

eliminate wood grounds between cement bases and plaster above. Furnished in three types: straight point, curved point, slant point.

Detroit Steel Corner Bead.

Rib Steel Corner Bead.

Corner Beads

Our Steel Corner Beads are galvanized after forming. We furnish four different types of beads in lengths from 6 to 10 feet, to meet every requirement for the perfect protection of plaster corners.

Detroit Steel Corner Bead—see illustration.

Detroit T-Rail Corner Bead — similar to Detroit Steel Corner Bead.

Rib Steel Corner Bead —see illustration.

Rib Feather-Edge Corner Bead—for fine, sharp corners.

Waterproofing and Technical Paints

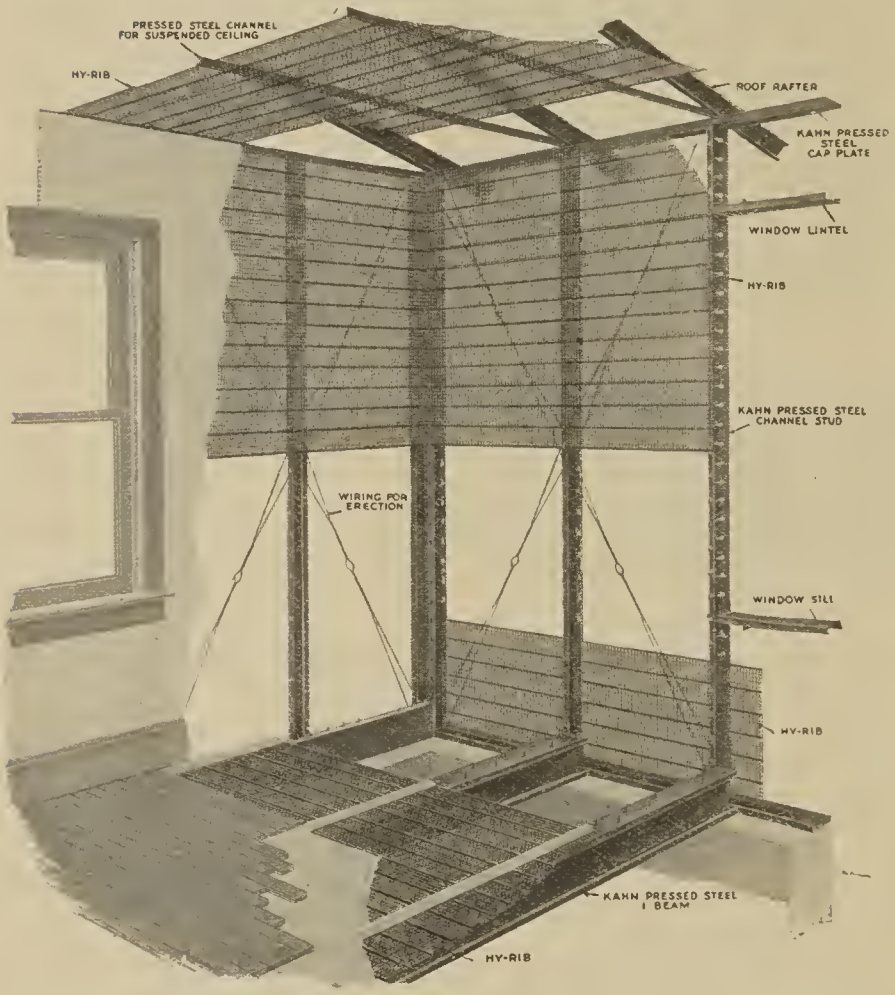
Concrete construction when in exposed positions should be properly finished and waterproofed by Trus-Con Chemical Products, consisting of a complete line of distinct products for this class of work. Handbook on request.

Reinforced Concrete

The Kahn Building Products, successfully used in over fifteen thousand important structures, includes the following reinforcing products. Kahn Trussed Bars, Rib Bars, Collapsible Column Hooping, Rib Metal, Hy-Rib, Steel Floretyles, Floredomes and Building Specialties. Also Trus-Con Inserts for attaching shafting; Kahn Armor Plates and Kahn Road Mesh for concrete pavements, and Kahn Curb Bars.

Steel Sash for Windows

United Steel Sash provide maximum daylight and permanence of window opening, have exceptional strength and superior weathering, are fitted with hardware made in our own plant, and include all types of sliding and pivoted sash, continuous sash, partitions, doors, casements, etc.



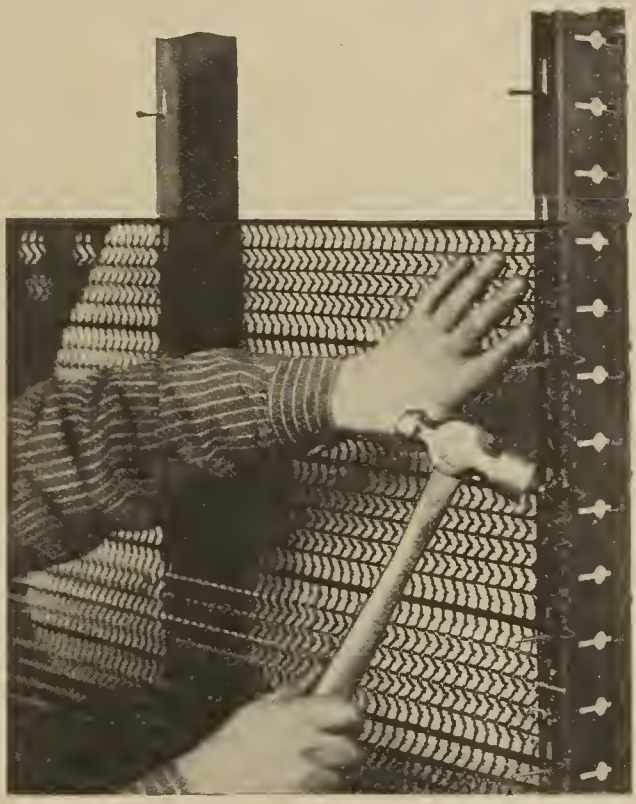
Kahn Pressed Steel Construction

(See also pages 87 to 89.)

3/8" **Hy-Rib Lath** is used extensively in connection with Kahn Pressed Steel Construction for floors, ceilings, walls, partitions, etc. This construction is fire-resisting, permanent and economical, being particularly adapted for group houses, apartment houses, small stores, and for floor construction generally.

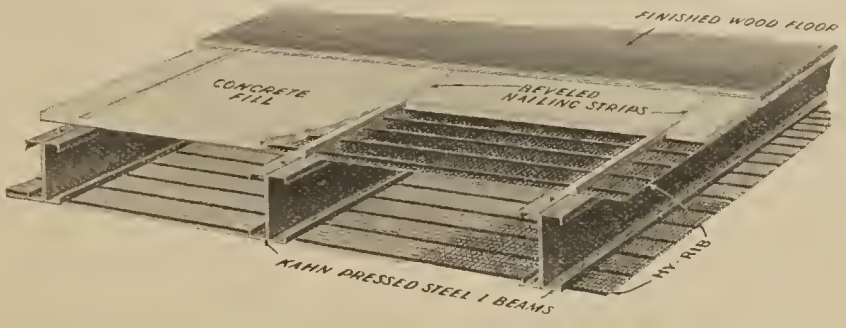
A large variety of Pressed Steel members, consisting of beams, channels, joists, rafters, plates, studs, etc., are manufactured by The Trussed Concrete Steel Co. They are fabricated completely in our shops so that no further work on them is required at the building site. The improved standard connection eliminates all punching, riveting and bolting. The only tool required is the hammer. The **Hy-Rib** is quickly attached by bending over the prongs on the Pressed Steel members.

Complete information, pamphlet, estimates, etc., will be furnished to interested parties.

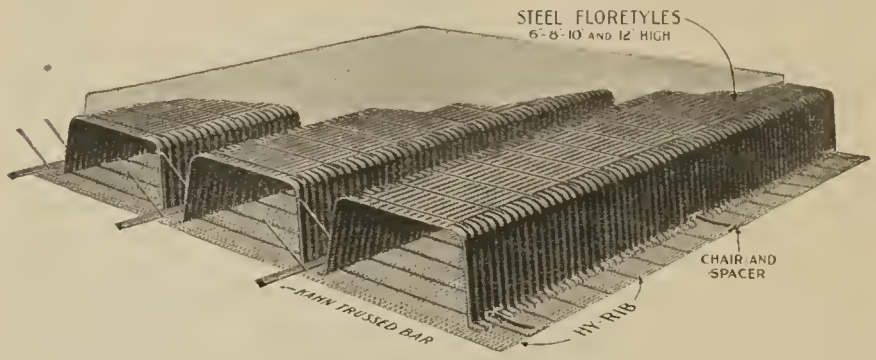


THE ONLY TOOL REQUIRED IS A HAMMER

The simple and easy way of attaching the ⅜" Hy-Rib Lath to Kahn Pressed Steel Studs.



STANDARD PRESSED STEEL FLOOR CONSTRUCTION WITH WOOD FLOOR FINISH AND PLASTERED CEILING.



Steel Floretyle Construction

3/8" **Hy-Rib Lath** is used for ceilings in connection with Steel Floretyle and Steel Floredome construction. The **Hy-Rib** forms a flat ceiling and provides a perfect surface for plastering.

Steel Floretyle construction consists of rows of hollow steel tile covered with a thin layer of concrete and separated by reinforced concrete joists. These joists, spaced approximately 24½" centers, carry the load directly to the supports, while the Floretyle acts merely as a filler, saving concrete and reducing dead load. The corrugated Floretyles have deep stiffening ribs across the top, and especially formed corners, corrugated sides and corrugated flanges along the bottom edges, so as to provide great stiffness in supporting loads.

Steel Floredomes are similar to Floretyles, except that they are only open on the under side, so that joists may extend on all sides of the dome, and carry the loads in two directions to the supports.

More complete information on Floretyle and Floredome constructions is furnished in special literature.

INDEX OF CONTENTS

INDEX OF ILLUSTRATIONS

Form D214 10M T.C.S.Co. Press 6-16-P.